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EDITORIAL.

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PARIS, December 15, 1911.

TUBERCULOUS HEREDITY—ANTITUBERCULOUS SEROTHERAPY.—These were recently the subjects of important communications at the *Academie de Medecine* in Paris. The first was delivered by Prof. Landouzy.

Tuberculous heredity has been singularly left aside since the discoveries of Villemin and R. Koch, by which inoculability and contagion have been demonstrated. Yet many investigators have kept their attention on it, and among them Landouzy, who, as early as 1883, established the fact that the question ought to be examined into from the double point of view of the heredity by seed (*hérédité de graine*), and heredity by soil (*hérédité de terrain*). In the first, the transmission of the bacillus of Koch from the producers to the fœtus (bacillar heredity). In the second, the congenital transmission of humoral, organic and functional malformations (dystrophying heredity).

The very numerous experiments of Landouzy carefully, carried out upon the hereditary transmission of the bacillus of Koch, have once more shown that this transmission is evidently possible, but it is very rare and practically can be and does remain considered as neglectable for the majority of medical

men. Congenital bacillosis, positively demonstrated in man as well as in animals, remains relatively sufficiently rare to allow the saying: "One is not born tuberculous."

Some guinea pigs, born of a tuberculous mother, well developed at birth, become diseased after a few weeks or months, even if, from the first day of their life, they have been taken away from their mother and kept in sterilized cages. Therefore it is not impossible for some cases, although very rare, of children of tuberculous parents to be born infected with latent bacillosis, tuberculosis developing only later in life. But it cannot be repeated too often that these cases are so exceptional that in practice they can be ignored and that the affirmation can be held that, properly speaking, tuberculosis is not hereditary.

With the heredity that Prof. Landouzy calls "of soil," his experiments show, as evidently possible, that products from tuberculous origin are frequently affected with important dystrophies; young ones born of tuberculous mothers died in youth in the proportion of 42 per cent.; the condition of development at time of birth is often lower than normal and their ultimate growth is often slower. Often at their post mortem, while no bacillary lesions are found, malformations of organs are observed, principally those of cardio-vascular nature, mitrate contraction, reduction in the size of the pulmonary artery, etc.—while, again, true lesions of congenital Bright's disease are found.

As conclusion, Landouzy says: "Many before us did not believe in heredity; assuredly many who come after them and and have eyes only for acquired contagion, drop in an opposite excess when they fail to recognize in the congenital debility of a child, the heredity of constitution and temperament, or, when in the disqualified series of some phthisic individuals, they do not see the degeneracy of the family and that of the race."

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The communications of Profs. Renon and Guinard on antituberculous serotherapy treated of the conditions necessary for

the scientific and practical value of an antituberculous serotherapy.

It is shown that although giving in clinical cases very irregular results, interesting at times, antituberculous sera are actually prepared with most different principles.

Some use exclusively soluble products or extracts of bacilli, free from all microbian elements; others employ emulsions of bacillar bodies or of living and virulent bacilli. To obtain an active serum, four, five or six months are necessary for some. Others require thirteen and fourteen months of preparation. With some, three, four or five years are required to obtain hyperimmunity of the animals. Others even tell us that the serum of animals so hyperimmunized have no curative and experimental value.

Some of the antituberculous sera now existing come from very immunized animals able to stand without effect the injection of very large doses of virulent bacilli. By opposition, other sera are obtained from animals which do not seem able to resist such test. How, then, can these non-immunized animals, able to take tuberculosis, give a preventive and curative serum?

An antituberculous serotherapy, truly scientific, ought to proceed from a unique principle of complete immunization of animals, and those ought to be refractory to any experimental tuberculosis. In man, a really specific serotherapy ought to have a positive action against all the manifestation of tuberculosis. It is impossible to judge the value of a serum with mild tuberculosis, of slow development, liable to recover alone or by simple cure of air and rest.

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PHASEOLUNATINE—ITS DANGERS.—As an additional or supplementary ingredient entering in the food of animals, it is not uncommon to find the beans of the *Vicia faba equina,* the horse bean—the kidney bean, as it is usually called. This mode of feeding is frequently used in large concerns, especially since the

introduction of sugared products. There are, however, other beans which are also found in the markets and which, if they have a pleasant aspect, and are liked by animals, it is better not to use too freely or even at all. If the kidney bean, the fruit of the *Vicia faba equina,* are scarce to obtain, others, such as the beans of Birmania, of Java or of Peru, varieties of the *Phaseolus lematus* can be given to horses in their place. *Dr. Mouilleran,* the director of the cavalry of the Omnibus General Company, emphatically says *no,* in the article that he has published in the *Recueil de Medecine Veterinaire.*

The stock of kidney beans was used up. The recolt had been poor, beans could not be had. Other beans of Birmany were offered, bought and given to horses in rations of 500 grams mixed with oats, corn, molasses and cut straw. The horses relished the mixture, ate it well, did well generally speaking, and worked as well as usual, keeping in good condition. The experiment made on a small number of horses proved a magnificent success, and a large purchase of beans was ordered to feed the whole stock. This was filled by the furnisher who delivered beans which came from Java and Peru. The three kinds of beans were about similar in aspect, color, condition of conservation, etc. But, as satisfactory as the first experiment had proved with the beans from Birmania, as serious and dangerous was the second with those from Java and Peru, as can be seen by the description of the manifestations given below.

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Mouilleron divides the forms of the disease in three characteristics: (1) one of anorexia; (2) another, localized to the digestive apparatus with complications of laminitis, and (3) the true intoxication, with nervous manifestations and generally fatal results.

Concisely considered, the following are the symptoms of the three forms.

1. After twelve, twenty-four or forty-eight hours from eating a mess of mixed food containing 500 grams of beans, the animal is taken with true disgust for all kinds of foods, no matter what it is. This anorexia lasts for two, three or even four days. Nothing, no treatment, no care or nursing can overcome it; he will not eat. And at the same time perfect condition of health is observed. All the general functions are normal, the animals are gay, strong, ready and willing to work. After a lapse of time, from one to four days, this loss of appetite subsides and recovery is complete.

2. In this form, two or three days after the eating of the same quantity of beans (500 grams), there appear general symptoms of colics, and diarrhœa, circulatory and respiratory troubles, followed with laminitis of a most serious nature, rapidly affecting in a few hours the four extremities, with, of course, general disturbances. In the majority of cases, after twenty-four hours of greatest pains, the symptoms subside, disappear completely, and in three or four days the animal has once more free liberty of his movements. The termination is simple, resolution perfect, and without complication.

3. The intoxication is complete, even after the eating of 500 grams of beans only. Suddenly the animal refuses all kinds of food, and is taken with liquid diarrhœa, sometimes bloody, painful and with rectal tenesmus. He has violent colics, collapse, and with great nervous and muscular depression. His respiration is disturbed, accelerated, 100 in a minute. The pulse becomes almost imperceptible. Feces have a repulsive odor. There is rectal prolapsus. The animal moves with the greatest difficulty, staggers in walking and falls. Sometimes, after three or four hours of pain, paraplegia or even complete paralysis occurs. If blood is extracted, it has the aspect of asphyxic blood; dark, thick. Death occurs in coma after five or six hours from the apparition of the first symptoms.

The nervous complications are frequent. They may be present from the start, and are characteristic. The eyes become congested, prominent in the orbits, the nostrils are dilated, muscular

twitchings are observed all over. The animals lose control of their instinct of conservation, have true attacks of vertigo, push against the walls, climb in their mangers, rear, fall violently on the floor, etc. These crises generally end in death, unless, if the intoxication is not complete, recovery may occur, with, however, a convalescence of short duration, eight or ten days at the most.

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It was an important question to find out the explanation of the various series of manifestations. To realize it an analysis of the various kinds of beans causing the trouble imposed itself. The botanic examination having demonstrated that the beans belonged to the same variety, the *Phaseolus lunatus*. To Prof. Guignard was trusted the task of analyzing samples from the three different species of beans, and his conclusions were that all the beans were cyanogen, although not in equal proportions; those from Birmania are less than those from Java and Peru. There exist in those grains a cyanhydric glucoside, the *phaseolunatine*, which under the influence of emulsine is, in presence of water, decomposed in glucose, cyanhydric acid and acetone. And it is to this cyanhydric acid that all those toxic manifestations were due.

The history of these cyanogen beans and the accidents that follow their use in man are well known, but in veterinary medicine they are comparatively unknown, having been recorded less frequently. In Germany, Drs. Dammann and Behrens have published several observations of intoxication occurring amongst animals fed with these exotic beans. Prof. Mosselman, of Belgium, has also made known the clinical and experimental observations that he has gathered with these varieties of *Phaseolus lunatus*. And if my memory is not in error, I believe records can be found of experiments relating to this kind of food in the publications of the United States Bureau of Animal Industry. At any rate, the article of Mr. Mouilleron is calling the attention

of those who might be tempted to introduce in the feeding of horses those exotic beans, which, under a most seducing aspect, contain a poison of extreme virulence: 8 milligrams for 100 grams of grains in the Birmania beans, and as much as 102 in the others, tell of the inocuity of the first and the toxicity of the second when a meal of 500 grams of beans was taken.

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EXPERIMENTAL SCARLATINA.—The study of some eruptive diseases and especially of scarlet fever on monkeys has occupied the attention of many pathologists, and the work of Grunbaum, recorded in the *British Medical Journal;* of Cantacuzene, in the *Review of Biology of Bucarest;* of G. Bernhardt in the *Deutsche Med. Woch.;* of Landsteiner, Ledaditi and Proser in the *Bulletin de l'Academie des Sciences,* and of L. Hektoen and G. H. Weaver in the *Journal of the American Med. Assn.,* with many others, show how great is the attraction that the subject offers, and although I have already alluded to this question in my Chronicles of last October, I will present a *résumé* of an article which has been published in the *Presse Medicale* by Dr. A. Gouget.

To isolate the pathogenous agent, and experimentally reproduce the disease, constitute the double object to obtain in the studies of the etiology of infectious diseases. As far as scarlet fever is concerned, the question of its pathogenous agent remains yet unsolved; as the opinion which considers it as a streptococcus has too many contradictors. It appears, however, that the experimental reproduction of the disease is possible; several authors have announced that positive results have been obtained with monkeys, which up to this day appears to be the only animal sensitive to the scarlatinous virus.

These discoveries are recent and have been published only a few months. They have been, however, preceded by those of Grunbaum, who, in 1904, attempted to transmit human scar-

latina to chimpanzees. To that effect he used the shirt or the bed sheets of diseased individuals, the peelings, the products of the washing of the throat, the cultures of *Streptococcus conglomeratus,* and even the blood of the heart secured shortly after death. He obtained only one positive result. A chimpanzee had his throat coated and rubbed with the washings of that from a scarlatinous patient. Four days after, he had a "doubtful" roseola, but without fever; the next day white spots over the amygdales with slight febrile reaction, followed by exudates. The roseola was principally developed on the abdomen, but did not have a scarlatinous appearance. The sore throat subsided and after three days of slight fever the temperature became normal. *Streptococcus conglomeratus* was isolated from the the throat of the chimpanzee. The case was positive but insufficiently demonstrative.

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Cantacuzene resorted to subcutaneous or intravenous injections in various species of monkeys, inoculating either blood taken from living patients during the first hours of the eruption, or pericardiac serosity or an emulsion of tracheo-bronchic glands obtained between three and four hours after death. Nine monkeys were inoculated. Of those, one had pericardiac liquid, another glandular emulsion, and the other seven subcutaneous injections. The two first gave a negative result. Of the balance, two died, one had only a local abscess, and the four others, which had also been inoculated with blood, emulsion or cardial fluid gave positive results: "After a varying lapse of time after the inoculation, the temperature rose to 40°, stayed between 40° and 41° for two or three days, and then dropped to normal. In the same time appeared a purplish eruption, uniform on the forehead and face, and spreading sometimes to the forearm. It faded away after thirty-six hours. Then came a desquamation on the face, the back and the tail. It was lighter on the legs. There always was adenitis, generalized to the inguinal

axillary and cervical regions. This lasted a long time after the acute phenomenas. There was a great polynucleose at the beginning of the eruption and eosinophilia at the end. No streptococcus was found in the cultures made with blood and pericardiac liquid.

Similar results were also observed in the experiments carried out by Bernhardt, with the monkeys that he inoculated with the white coating of the tongue of scarlatinous patients, making with it an emulsion with physiological water and injecting it in the inguinal region under the skin while at the same time the mucous membrane of the cheeks and the tongue were rubbed with the same emulsion. The symptoms were very similar to those found by Cantacuzene. Besides these, Bernhardt succeeded in reproducing similar characteristic symptoms with scarlatinous virus passed three times in succession from monkey to monkey. It is to be noticed that in this last experiment, while in the animals of the first passage the glands often contained streptococci, there were none after the third and yet the glands remain virulent. More recently Bernhardt has succeeded in reproducing the same clinical manifestations after eighteen days of incubation, by rubbing the buccal mucous membrane of monkeys with the scrapings of the scarlatinous tongue.

From the experiments of Cantacuzene and of Bernhardt, it is evident that the presence of streptococcus must be put aside as being the specific agent of scarlet fever.

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Besides these series of experiments, positive in fact, others must also be considered, even if they are contradictory.

Landsteiner, Levaditi and Prasek have resorted to a mixed method on chimpanzees. One of these animals had its throat coated over several times with the blood taken from the amygdales and pharynx of scarlatinous children; in a second animal the coating was done with the exudate of a scarlatinous sore throat and a subcutaneous injection of scarlatinous blood; with a third the exudates from the amygdales of the second animal

were used and the following day an injection of blood from this same second monkey, and finally the other chimpanzees had their throats swabbed and a subcutaneous injection made of cultures of streptococci made with material from the throat of the second chimpanzee and blood from a scarlatinous patient.

The result of these fixe experiments was negative except one, which even the authors do not affirm to have been a reproduction of scarlet fever.

In their experiments, Hektoen and Weaver selected the digestive canal for inoculation. From the secretions of the throat and mouth of scarlatinous children collected with cotton swabs, and which were washed with milk, thirteen monkeys were fed. Ten remained perfectly healthy and three died. Result rather negative.

If lame conclusions can be derived from this brief review of some of the experiments made, it seems that those of Cantacuzene and of Bernhardt are the most demonstrative. If further experiments should come and confirm them, two precious facts will have been established: first, that monkeys are the true animals for the study of the etiology of scarlet fever, and second, that streptococcus must definitely be ignored as the causal pathogenous agent of this disease.

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Congress of Comparative Pathology.—Since some ten years a Society of Comparative Pathology has been organized in Paris, and has met with considerable success. Holding monthly meetings, it counts among its members veterinarians and physicians, many belonging to several of the schools of human and veterinary medicine, and the list of its honorary and active members compares advantageously with that of any other scientific organization. At the meetings papers pertaining to both branches of medicine are presented, and the *Revue de Pathologie Comparée* is the organ where all the work of the society is published.

The first organization of this kind in France, and, I daresay,

the only one which has succeeded, it has decided to make a powerful effort and to organize an *International Congress of Comparative Pathology* to hold its meeting in October, 1912. So far only the foundations are being laid down, and before publishing the program a letter has been directed to a large number of veterinarians and physicians asking them to co-operate and send their adhesions to the congress, with also a few inquiries such as to what questions seemed to be the ones to be discussed, whether communications could be expected, etc.

The general secretary of the society, Mr. Grollet, 42, rue de Ville, has a hard task before him, but if energy and ability are the necessary elements for the success of the congress, it is sure to be great and of very valuable importance to comparative pathology. I will have opportunity to refer to this as soon as the official program is published.

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Bibliographic Items.—Prof. J. A. Gilruth, D.V.S., M.R.C.V.S., and Georgina Sweet, D.Sc., of the Melbourne University Institute, have written a long article on "*Onchocerca Gibsoni*, the cause of Worm Nodules in Australian Cattle," which has been published with the addition of "Notes on Worm Tests in Australian Cattle and in Camels," by Dr. J. Burton Cleland, M.D., and E. Harvey Johnston, M.A., both from Sydney. The whole forms a pamphlet of some forty pages, abundantly illustrated, where the history and distribution of the disease in Australia are given with also the pathological history, macroscopic and microscopic appearance, the structure, development, life history, bibliography, etc.

"A Simple, Effective and Inexpensive Method of Treating the Arsenical Dipping Solution Before Emptying Vat for Cleaning" is a communication published in form of pamphlet by Dr. W. H. Dalrymple and A. P. Kerr, of the Agricultural Experiment Station of Louisiana.

COMMUNICATIONS ACKNOWLEDGED.—Dr. Robt. Dickson, of Fair Haven, N. J.—*Quarterly Bulletin,* Chicago Vet. College, September, 1911. A. L.

PENNSYLVANIA POINTS THE WAY.

On other pages in this number, we print an open letter sent to the Governor of the "Keystone State" by one of the members of that state's board of veterinary medical examiners who, after sixteen years of loyal service, was not reappointed because of his political convictions, and because a once powerful, but tottering political machine required more pliant men, that sinister political influences might be better served.

We have frequently pointed out this one great danger of every state board under our political system, and now that the one state, that has withstood for sixteen years this peril, has at last under purely political exigencies fallen from its high state of advancement, it only repeats what has followed in many other states where state laws have been enacted.

Doctor Hoskins does not suffer personally, but the profession of his state (98 per cent. of which asked for his retention), is humiliated, and efforts to continue a high and equitable standard to every applicant, and to enforce the law without fear or favor, menaced. It has already borne fruit in that there are now two standards in that state—one for law breakers, and one for the young, rising, ambitious graduate.

It surely establishes beyond peradventure the greater need of a Federal license (as recommended by Dr. Hoskins to the *Association of Faculties and Examining Boards* at the forty-seventh annual convention of the American Veterinary Medical Association at San Francisco, California, in 1910, and with which we were much impressed at the time), that shall give to American veterinary medicine a fixed and definite standard under civil ser-

vice regulations, that shall be a saving grace to all our state laws, and fix our standard at home and abroad beyond the dangers of corrupt political machines or the sordid, selfish power of any one man.

Dr. Hoskins points out the danger and fearlessly with his pen endeavors to preserve the manhood, self-respect and political independence of his colleagues in the profession.

ARMY BILL NO. 16,843 AGAIN.

In our last month's number we gave a considerable amount of space to the publication of Bill No. 16,843—"*To Consolidate the Veterinary Service, United States Army, and to Increase Its Efficiency*"—and to a considerable amount of data calculated to instruct the veterinarians of the United States on the various aspects of the questions at issue, and to enthuse them into action. Matter published in the "Army Veterinary Department," and reports of society meetings in the present issue, clearly demonstrates the fact that many of the veterinarians throughout the country were *already* in action; and from comments in letters recently received from all over the country, we are gratified to learn that the space devoted to the *Army Veterinary Bill* in the January number of the AMERICAN VETERINARY REVIEW had the effect of enthusing men who had not realized the veterinary conditions in the army, or that an active campaign was being waged for their betterment. Those were just the men we wanted to reach, in addition to *increasing* the enthusiasm of those already at work; and results obtained have prompted us to extract from a report of the organization of the *Canadian Army Veterinary Service,* with the hope of further stimulating the veterinarians of the United States, to the end that we shall get from the present Congress what Bill No. 16,834 asks for our brothers in the army.

Our late receipt of the Canadian matter necessitates that our extracts from it be scattered throughout the number.

ORIGINAL ARTICLES.

THE VETERINARIAN AND POISONOUS PLANTS.

By D. Arthur Hughes, Litt. M., Ph.D., D.V.M., Chicago Veterinary College.

To the veterinarian in the rural regions poisonous plants are frequently a source of difficulty, because animals are injured by them and because he commonly is ignorant of the dangers arising from them. He finds himself called to see an animal presenting symptoms of poisoning, the cause of which he cannot guess, until, perhaps by chance, he observes the fodder on which the animal has been fed, or makes an observation of the land upon which the animal has grazed, to be driven to the conclusion that poisoning likely has taken place from ingestion of a noxious plant. But he is not positive of his diagnosis. The symptoms are unusual, or at least there is difficulty in determining the cause; the seriousness of the condition is obvious; the death of the animal comes all too soon without a chance to arrive at a positive opinion on what the poisoning may be.

From the standpoint of the study of poisonous plants, and that of the desire to obtain information of value on plant poisons and poisonings, the difficulty is increased by the meagreness of the present knowledge of such plants and the sparseness of the records of such poisonings. Surgical case reports, parasitological or obstetrical case reports, are common enough; but case reports of poisoning from noxious weeds are a *rara avis*. We know that poisonings from eating noxious plants are common; yet the records of them are not made, at least not published. I have frequently been the recipient of letters from students making

inquiry about supposed poisonings. But the information furnished is usually scanty and the questions wide of the mark—a scrap of history; a line or two on symptoms; a piece of the suspected plant and a question as to the harmfulness of the plant. The rural veterinarian, like his city brother, is apt to do things in a hurry. Specimens of plants sent in for examination are transmitted oblivious of the fact that specimens of the whole plant in bloom are usually necessary in order that determination can be made of what they are; besides, the roughness of handling of packages in the mail should be borne in mind, else packages of specimens may arrive as a mass of dry, disintegrated vegetable matter instead of in intelligible shape.

The usefulness of the study of poisonous plants must, from these observations, be manifest to practitioners in country places. Sooner or later they are sure to be confronted with problems of the determination of the name, descriptive character, peculiarities and possible toxic nature of plants in the regions where they practice, and they are apt to be at sea and puzzle-headed without that information in case poisonings occur. There are so many different ways that poisonous plants become troublesome to practitioners, and the troubles are so grievous to the owner, that appeal is sure to be made to the veterinary expert. Numerous poisonings of stock occur from cutting and garnering noxious weeds when hay is cut in the meadow and by serving this up to animals, the owner being unaware of the danger to his stock. Poisoning from lupine hay, for example, occurs in this manner, and sheep are carried off by the carelessness or heedlessness of persons having no knowledge of the characteristics of this plant, and the toxicity of it under certain conditions—before the ripening of the seeds in the pods—lupinosis being the result. Again, many poisonings are brought about by permitting animals to forage on harmful plants in the open, especially in those unpropitious seasons of the year when little herbage but the green leaves of such plants as the purple or white loco weeds can be found for food. The worst of it is that many poisonous plants on which animals may crop are not at

all distasteful to their palates; indeed, many are succulent and attractive, so that animals eat and keep eating to their own destruction. There are also many instances of poisoning by accidental eating of poisonous plants, for example, the eating of oleander leaves by horses driven up and tied to posts near lawns on which the oleander is in bloom, the result being a poisoning simulating digitalis poisoning; or when cattle or sheep accidentally browse upon the beautiful mountain laurel, another favorite of the lawn, which, when eaten, rapidly produces death.

Undoubtedly poisonous plants should be made a branch to be taught as part of every veterinary college curriculum. But when and how? The ideal way is to have the study of poisonous plants preceded by at least a modicum of descriptive and physiological botany sufficient to give the student some knowledge of classification and arrangement of plants by means of analysis and the gathering of an herbarium, together with information on the functions of plants in part and whole and the organic materials that are formed by them; which is the basis of materia medica. The study of poisonous plants may then be taken up in earnest by means of laboratory and field work, and by means of lectures on at least the most important poisonous plants—those widely destructive to domestic animals, such as loco weeds, larkspurs, lupines, poisonous hemlocks, death camas and the like. The veterinary student cannot be expected to take much interest in botanical technology, in purely botanical knowledge that runs foreign to his particular desires and aptitudes, which instinctively compel him to confine himself to such plants and such botanical knowledge as will help him in his everyday practical service of the public. The lecturer on poisonous plants, therefore, should, as far as possible, devote his attention to widely destructive plants, the amount of harm they cause; the appearance of the plants and means of identification; the symptoms of the poisonings; the course of the poisonings; the post-mortem appearances; medication and preventive measures. This must be the work of a veterinarian rather than a botanist; for it is the veterinary aspect of the case which rightly appeals to the veterinary stu-

dent, and this is more apt to be dealt with successfully by a veterinarian than by a man whose inclinations are towards botany purely, rather than towards the adaptation of a knowledge of poisonous plants for the purposes of the veterinary art.

It is true, as I said in a paper on poisonous plants written for this journal several months ago, that the curricula at the veterinary colleges are suffering from congestion, or at least they are plethoric with the new blood which has been given them with the standardization which has come since the U. S. Department of Agriculture began to take a hand in their work. Yet it seems to be generally agreed that the study of poisonous plants must be given a place even in the present congested curricula. How much the more time can be given to this branch when the curricula are made longer and the length of the courses extended to four or more collegiate years. The popularization of the subject is easy, especially if a man confines himself largely to widely destructive plants. Lectures on poisonous plants, of the kind that I have mentioned, given by an enthusiastic lecturer, with a pleasant delivery and facile speech, cannot help but arouse interest and inform the students. Demonstrations of plants by the aid of an herbarium, photographs, photogravures or electrotypes, and charts are helpful. Quizzes, oral and written examinations, will stimulate the student to industry and cause him to devote some time to the theme.

This leads me to offer a few suggestions to practitioners. The first is regarding sending specimens of plants, believed to be poisonous, by mail. Whenever the rural practitioner is in a quandary as to the harmfulness or harmlessness of plants in his region; whenever he suspects certain plants to be noxious, or whenever he is disposed to attach blame to one or another of them for constitutional injuries he finds in an animal or animals in his region, there are means of ascertaining the facts or of putting authorities in the way of learning the facts by examination of specimens. The United States Government has a laboratory devoted to the determination of the cause of poisonings, of

the study of poisonous plants, where the best facilities are at hand for the study, and where information can be had which will be of value. Specimens may be sent to Dr. Rodney A. True, Physiologist in Charge of Poisonous Plant Investigations, Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C. He will be glad to offer assistance in a dilemma. Most of the state experiment stations also have experts on their forces who can be of assistance in case of need. A letter asking for information addressed to the Director of the State Agricultural Experiment Station will bring results. There is a further value in this, that by this means the botanists of the States can keep in touch with needs of the farmers in the determination of poisonings caused by plants and can be of service to the professional men in this matter. Furthermore, the veterinary colleges are more and more giving some time to imparting instruction on poisonous plants, and they, no doubt, will invite correspondence on the subject. They are willing in every way in their power to give aid where it is needed. In sending specimens the transmitter should bear in mind that he should give all aid possible to the person to whom the plant is sent to enable him to arrive at a correct determination of the noxiousness or innocuousness of the plant. Usually the specimen should include the whole of a plant whenever possible. If the plant is small, it would be easy to compress it carefully and send a sample including flowers, leaves, stalks, roots. If the plant is large, samples of flowers and leaves should be sent together with information on the plant in general. Knowledge of the seeds also is at times necessary. The common name of the plant given to it in the region should also be furnished. The common or popular names of plants in different regions vary, though when this information is furnished it may be helpful in making the determination. The package should be wrapped and tied with such care as will prevent the plant from being broken up in the mail. My experience teaches me that persons transmitting specimens, from their anxiety and hurry to get information, forget to exercise sufficient care in transmittance and so make it im-

possible for the receiver of the plant to make a determination of its identity, nor can he be accurate about his answer.

Practitioners are beginning to seek printed information on poisonous plants, and it is high time that more appeared in our veterinary journals which will be useful to them. A certain amount of journalistic literature on poisonous plants is sporadically appearing, including short pamphlets which are commonly preliminary and not careful, exhaustive studies of plants. These are apt to be of a fugitive nature, to use the German phrase, and the information they furnish is sparse, though they may be very suggestive of work to be done. For example, about two years ago, a short bulletin on the garden oleander was issued by the Arizona Experiment Station, in which many facts were brought out about the dangerousness of that beautiful lawn plant to horses and goats. Again, an article on woody aster poisoning of sheep, from a station in the Rocky Mountain region, also excellent in its suggestiveness, has appeared; neither of these, however, are complete studies of the subject. A better grade of papers on poisonous plants is to be found in the United States and Canadian Government Reports. In the annual reports of the Bureau of Animal Industry are to be found splendid studies of many poisonous plants which destroy the various species of domesticated animals. The work of Chestnut and Willcox in those reports are among the earliest and best studies of plants poisonous to animals. I have the good fortune to possess a full set of the annual reports of the Bureau of Animal Industry and I have occasion to frequently refer to them for information on poisonous plants. The Canadian Reports of the Veterinary Director General and Live-Stock Commissioner, also printed annually, are becoming more useful to the live-stock industry every year. For example, in one of the most recent ones, that for 1909, occurring as Appendix No. 10, by E. A. Watson, V.S., there is a most excellent account of loco weed poisoning in Canada and investigation of it at the Quarantine Station, Lethbridge, Alberta. The article is illustrated with photogravures of equines and bovines in various stages of the

loco weed poisoning. However, it is difficult for the veterinarian in the hurly-burly of private practice to become informed of the outcoming of these articles; nor is it possible for him to read many of them, lengthy as they are, when they do appear. There are digests printed of articles on other branches of veterinary medicine found in current veterinary literature; why should not digests of articles on poisonous plants appear? There is a good reason why this is not done. Few persons are acquainted with poisonous plants; can identify them; know their harmfulness; or can produce the digests needed.

There is, therefore, an obvious necessity for the practicing veterinarian to lean on some manual, in order to prevent himself from being at sea when cases of poisoning occur. How does the necessity arise? There are many individual cases of death of animals which, because of the attending circumstances, cannot be otherwise than ascribed to plant poisonings. Suspicion is cast upon certain plants upon which the animal was known to feed for days or weeks previous to his death. These plants, it may be, are suspected in the neighborhood of being poisonous, and circumstantial evidence is at hand that death occurred from ingestion of the plants in question. Again, a large share of a flock or a herd may be decimated when being driven through a region where one or another of the poisonous plants abounds, as has frequently been the case with larkspur poisoning in that part of the central West east of the Rockies, where delphinosis is common. How is the veterinarian consulted to know the cause of death, especially if he is inexperienced, unless he has information on poisonous plants, or else can obtain it from some reliable manual? Lawsuits are sometimes started by enraged owners against railroad companies for permitting animals in transit to be fed and watered at a point where such plants as larkspurs flourish. I have in mind just such a case where a railroad company seemed to be liable for the death of a large share of a flock of sheep in western Nebraska, which occurred, presumably, from eating larkspurs.

What, then, is to be the helpful work of reference which will be of greatest service in these emergencies? One of the difficulties in the way of priming men on plant poisonings has been, up to the present time, the absence of any publication which contained enough and was extensive enough to be of any value. Happily, we have now a work on poisonous plants, encyclopedic in character, which can be cordially recommended as a work of reference for the profession. I am speaking of that monumental work just completed by L. H. Pammel, Ph.D., Professor of Botany, Iowa State College of Agriculture and Mechanic Arts, entitled "A Manual of Poisonous Plants, Chiefly of Eastern North America, with Brief Notes on Economic and Medicinal Plants and Numerous Illustrations."* Dr. Pammel was a man of large reputation as an author of articles and treatises on poisonous plants long before he undertook the task of writing his encyclopedic manual. He had catalogued the poisonous plants of Iowa and had written pamphlets and monographs on regional medicinal and poisonous plants. One of the most recent of these was his well-illustrated bulletin published by the State Department of Agriculture, entitled, "The Medicinal and Poisonous Plants of Missouri," which received favorable comment from Dr. Glover, of Colorado, in his presidential address before the American Veterinary Medical Association at Toronto last summer. A man of such aptitudes was bound in time to find fellowship with a profession which has to do with the detection of poisonings caused by plants in animals. Consequently, Dr. Pammel has always been a friend to the veterinary profession and has done much in Iowa and Missouri to point out to them harmful plants and to catalogue them for them. Time is an increment in the preparation of so large a work as Dr. Pammel has written. A man does not write his *magnum opus* in a day.

* A Manual of Poisonous Plants, Chiefly of Eastern North America, with Brief Notes on Economic and Medicinal Plants, and Numerous Illustrations, by L. H. Pammel, Ph.D., Professor of Botany, Iowa State College of Agriculture and Mechanic Arts. Part I.—General Treatise on Poisonous Plants. Part II.—Key for Plant Kingdom. Catalogue of Poisonous Plants. Bibliography of Poisonous Plants. Index. Containing 977 pp., octavo. Green cloth. Black lettering. The Torch Press, Cedar Rapids, Ia., 1911.

And Dr. Pammel has taken many years to prepare this work. Indeed, it is something like two years ago since the first part of the work was issued from the press, and when it was our pleasure to comment upon it in the AMERICAN VETERINARY REVIEW. A work of so great a magnitude must also necessarily be lengthy.

A primer on poisonous plants would have little usefulness for the veterinarian. What he wants is a comprehensive work on the subject to which he can hastily refer to determine, if possible, the name of the plant he suspects, its known danger to our animals and the effects it causes so far as they are known. In his " foreword," or prefatory remarks, Dr. Pammel acknowledges that much of the literature on poisonous plants is scattered and hard to obtain, and he states that he has made an effort to bring together in his pages the results obtained. This, indeed, is just what the busy veterinary practitioner would expect of him and would look for in a work of this character. Elsewhere he states that many persons would object to the great number of plants which are regarded in his work as poisonous. He has rightly placed the broadest interpretation on the subject and has included in his work all plants that are injurious, although many of them are not known to produce poisons, some of them being most useful economic plants, yet injurious to people, and he should have added injurious to animals.

Pammel's book will be a boon to the veterinary practitioner in the country communities, and will, in time, find its way into the libraries of many veterinarians who aspire to a successful country practice. It is not a work to be read page by page or devoured with that fervidness with which city ladies are observed to devour the latest novel. It is a work of reference, covering, in almost a thousand pages, the facts as they are known to-day about poisonous plants. It takes up, in almost bewildering detail, such subjects as bacterial poisons, dermatitis, forage poisoning, fungi poisoning, equisetosis, locoism, lupinosis, delphinosis. In fact the whole field of poisoning is covered. Even we find a classification of poisons; remarks on the production of poison in plants; on the chemistry of alkaloids and glucosides,

and a catalogue of the most important poisonous plants of North America. So comprehensive a work is sure to have special features, and these in Pammel's large volume consist of a key to the plant kingdom to enable one to determine the family to which a poisonous plant belongs; a catalogue of the poisonous plants of the world, as far as they are known; a complete bibliography to all the literature accessible on poisonous plants, and an index to the whole work.

Dr. Pammel's work is to poisonous plants of North America what Ostertag's work is to meat inspection or what Neumann's work is to parasites. This will give some notion of its comprehensiveness. The work is not meant, apparently, to be a textbook, as perhaps Ostertag's might be if a lengthy course on meat inspection were to be given. It is bulky, resplendent with detail, and encyclopedic in its expansiveness. Its merit is that it is a book to be kept on the shelf, and looked into when occasion calls for reference to it, when tough situations arise of suspected poisonings. Its deficiency is due to the ignorance of our times. The veterinary profession has much to learn about poisonings caused by organic materials in plants. Our veterinary literature is weak in its records of cases of poisonings caused by plants, the causes, symptoms, and post-mortem findings. Pammel has endeavored to assemble the facts from medical and veterinary literature covering plant poisonings, and these facts are put in their proper place in his work under the different plants. But the truth is much lacking, owing to our own deficiencies. The gaps will have to be filled in as time goes on when more records will be made of cases of poisoning in veterinary literature.

What, now, does the appearance of such a work as this by Pammel suggest on poisonous plants as a field of study?

There can be no doubt that many plants cause poisoning of domesticated animals; still less can we doubt the seriousness of many of the poisonings when they occur. There is an absence of clear-cut descriptions of the symptoms, course, post-mortem findings in these poisonings, and little known of medication or prophylaxis. There are a few forms of poisonings of which we

know something—such as locoism, delphinosis, hemlock poisoning, lupinosis, ergotism, mountain laurel poisoning. Too few post mortems are carefully made. Accurate descriptions of symptoms are not recorded. Enough curiosity is not aroused to discover causes of poisoning. The chemistry of plant poisons is in its infancy. This field is bound to broaden as is indicated by our present ignorance. Manufacturing chemists have exhibited a fearful neglect of plants now called poisonous, which will prove to be medicinal plants with many virtues in the alleviation of disease when their merits have been studied, and can become utilized in therapeutics. Many plants are suspected of being poisonous to animals in the regions devoted to live-stock raising. In many instances determination has been made, through reports of individual cases of poisoning, that many plants are toxic, though it is far more difficult to determine the actual cause of the toxicity. This can only be discovered by tedious and painstaking investigations, extending, in many instances, over years. The path of the student of plant toxicology is beset with many difficulties, as many plants only in part are toxic; or only in certain periods of their growth; or under conditions of decay; or because of alterations in their substance produced by seasonal conditions. But much earnest work is being done to discover the plants that are poisonous; the conditions under which poisoning takes place; and the cause or causes of the poisonings. Though there are difficulties in the way of the determination of poisonings caused by plants, the study is of practical usefulness. It may relieve the veterinarian from many embarrassments and secure for him new medicaments, widen the field of materia medica and therapeutics.

THE B. A. I. VETERINARY INSPECTORS' ASSOCIATION held their monthly meeting on December 18. Peculiar cases found on postmortem inspection and many other questions of interest are discussed at these meetings, making them profitable to members.

Two subjects discussed at length were: "Proper Manner to Conduct Postmortem Inspection in Order to Detect Beef Measles," and "The Importance of Ante-Mortem Inspection of Hogs Affected with Cholera."

ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

By D. E. Salmon, D.V.M., Montevideo, Uruguay.

V.

Accumulation and Tolerance of Arsenic.

Arsenic Trioxid in the Bones.—A very clear example of accumulation in the bones is furnished by a mare on which autopsy was made August 15, 1906, being No. 38 of our series. The animal was a large, fine-looking roan, about eight years old, in good condition of flesh, and weighing about 1,300 pounds. She belonged to a farmer whose ranch was located about 12 miles north of the smelter, and who stated that the animal had fed mostly on hay, but occasionally was pastured. For nearly a year he had noticed a progressive loss of strength, which had reached such a degree that she was no longer able to work, as was shown by profuse perspiration, weakness, evident suffering and complete exhaustion when the effort was made to utilize her services.

An examination revealed difficult respiration, carried on largely by the abdominal muscles, bronchial râles and weak action of the heart. As the owner said the animal was of no value to him, she was killed by shooting, and an autopsy made immediately afterwards.

The fat was very yellow. There was considerable effusion in the peritoneal cavity and several ounces in the pericardium.

The lungs showed thickened pleura, and some exudate on the lower, anterior and median portions. There were, also, two small areas of pneumonia, several hæmorrhagic spots, and many of the finer bronchi were plugged with mucus. The heart was firm and weighed 7¼ pounds; the liver weighed 17 pounds, the

right kidney weighed 2½ and the left 2¼ pounds. Considering the size of the animal, the heart and liver may be considered of normal weight, but the kidneys were evidently considerably enlarged.

On section, the cortical substance of the kidneys was pale in color and the glomeruli showed on the cut surface as small, blood-red spots. The medullary portion was red. There was a thick, albuminous liquid, carrying a white substance in suspension, in the pelvis, and a similar material oozed from the cut surface of both the cortical and medullary portions.

The pyloric portion of the stomach was very red and inflamed. The small intestines were congested in many places, there being several deep red patches at least a foot long. Both the serous and mucous coats of the colon were red, and the latter was covered with a layer of brown pigment which was probably the remains of a hæmorrhage of several days' standing. The cæcum was deep red throughout, with numerous erosions. The uterus and bladder were congested. The brain was slightly congested.

On making a longitudinal section through the femur and humerus, the compact bone at the surface was found to be exceedingly thin, while the spongy tissue seemed to be in a degenerated condition. In the median portion there was a soft, pasty, bloody mass, and in the other parts the spaces were filled with free, yellow, transparent oil. The appearance led to portions of the bone being taken for analysis, the result of which was that, whereas the liver carried but 4.99 parts of arsenic per million, these bones carried 20.67 parts, or more than four times as much. This large quantity of arsenic in the bones is probably unusual and especially worthy of note.

A microscopical examination of the urinary sediment revealed considerable renal epithelium.

This animal had evidently been suffering from chronic arsenical poisoning for a long time, but the symptoms recently had become more acute. Whether this was due to a larger quantity of arsenic in the food, to the disease of the kidneys having

propressed to a point where the poison was not so readily eliminated, or to the greater accumulation of arsenic in the tissues generally, could not be determined from the accessible data.

Another animal which carried a large quantity of arsenic in the bones was a colt (Post-mortem No. 27, July 3, 1906) about a year old, which was pasturing about 2 miles south of the smelter. This colt was unthrifty, thin and anæmic, the hæmoglobin being only 50 per cent. by the Tallqvist scale.

There were 4 or 5 ounces of straw-colored liquid in the peritoneal cavity, 2 ounces in the pericardium, and about 2 ounces escaped when the dura mater was punctured. There were 15 or 20 small hæmorrhages under the capsule of the spleen and slight blood discolorations beneath the endocardium. The capsule of the liver was thickened, making the organ appear almost white when first exposed, and the connective tissue throughout the organ was more prominent than in normal animals. There was a chronic catarrhal condition of the stomach and small intestines.

The chemical analysis of the liver gave 3.3 parts of arsenic trioxid per million, while that of the bone gave 13.2, or four times as much.

It is not possible to say what proportion of the animals on which autopsies were made had bones which carried such an astonishing quantity of the poison, for the reason that few analyses of the bones were made. As a rule the bones are not examined in cases of arsenical poisoning, and it appears that when tested the analysts have generally been satisfied to discover the presence of arsenic without determining the quantity. Probably for this reason the writer has not been able, in the literature available to him, to find a statement of the quantities of this poison which have been, heretofore, obtained from these organs.

Brouardel(1) gives the following interesting summary of the conclusions of Pouchet from investigations made in 1879:

"Whether the poison was introduced by ingestion, by hypodermic injection or intravenously, the arsenic accumulated to a notable extent in the spongy tissue of the bones and was fixed there in such a manner that its presence might be revealed in

the bones of the cranium and the vertebrae, especially, some time after all trace had disappeared from the viscera in which it was localized in the greatest quantity, such as the liver.

"This localization in the spongy tissues of the bones was particularly clear and intense when the arsenic was absorbed in small doses continued for a long time. * * * Thus localized, it was eliminated with great slowness, and, with a certain number or animals, it was clearly revealed by the Marsh apparatus up to eight or ten weeks after the cessation of the intake of arsenic, the dogs and rabbits under experiment being placed in the best possible conditions, for the prompt and complete elimination of the poison."

Arsenic Trioxid in the Hair.—The condition of the hair received considerable attention in this investigation, and the results of the few analyses were fully as interesting as were those of the bones. Some of the experts for the farmers reported cases in which the hair had fallen, leaving the skin bare. The writer, however, did not observe any clear cases of this phenomenon. On the contrary, however, the hair was often long, dry and lacking in lustre. In many cases there were patches of very long hair on the withers, croup, sides and upper portions of the limbs. This was generally spoken of as unshed hair, that is, hair which had been retained at the time the old hair on other parts of the body had fallen, and had continued to grow. As is well known, such patches of unshed hair are often seen late in spring on horses which have had insufficient feed during the winter, and which are, consequently, in an unthrifty and anæmic condition. It is possible, however, that in some of these cases in the Deer Lodge Valley the patches of long hair were due, not to its having been retained at the period of shedding, but to a stimulated growth as a result of the local action of the arsenic.

Brouardel(2) says arsenic is reputed to have a special action on the hair and nails, and that the horse traders and coachmen of Austria administer it to their horses with the object of giving them a lustrous coat, agreeable to the eye; also, that the arsenic eaters there, while expecting to gain in flesh and to become more

agile, also hope, especially the women, to beautify their hair. He adds that in France arsenic has not produced such happy results, and that there are numerous examples in which an arsenical medication has caused more or less complete alopecia.

Lancereaux, he says, has published an observation which is the inverse of those to which allusion has just been made. He treated a girl of thirteen years who presented a febrile condition, recalling that of continued fever, and it was only after more than a month, when paralysis appeared, that a diagnosis of arsenical poisoning could be made. When Lancereaux saw this girl he noticed that her legs were covered with hair, but at the time did not connect this phenomenon with the intoxication. The following year he had occasion to see the girl again, for an entirely different affection, and observed on her legs long, thick hair, which masked the skin as the hair of an infant conceals the skin of the head. This hypertrophy of the pilous system, which was only temporary, had for its seat exactly the parts which had been affected with paralysis.

This interesting case, the only one of the kind which has come to the attention of the writer, is referred to as, perhaps, explaining some of the cases in the Deer Lodge Valley of long, patchy hair on colts which were so young as to make it improbable that the long hair was due to its retention at shedding time.

Mann(3), especially, has called attention to the affinity of the keratin tissues, including the hair, for arsenic, and to the relatively large quantities which they may carry. The following extracts from his testimony before the Royal Arsenical Commission is of much interest in this connection:

"I next took some of the horny scales that you find on the feet in keratosis, which is very common * * * in chronic arsenical poisoning. I must confess that I was astounded with the amount of arsenic which was present in the horny scales, and, also, in the other skin appendages, the hair and particularly the nails. * * * For instance, I got ample evidence of the presence of arsenic from 0.2 gram of the horny scales, and from

0.1 gram, and even from 0.03 gram. * * * I obtained well-marked crystals without any difficulty whatever. * * *

"In amounts of hair varying from a gram to half a gram, and even in 0.2 gram, I found arsenic. * * * I was particularly struck with the affinity of these keratin tissues, the horny layer of the epithelium, the hair and the nails, for arsenic, and the large amount that they would take up."

These very interesting observations, which apparently did not include any accurate, quantitative determinations of the arsenic, led the writer to suggest to Swain and Harkins that a number of quantitative analyses be made of the long hair of some of the Deer Lodge Valley horses. In this they readily acquiesced, and, although the remarks of Mann had led to the expectation that considerable arsenic might be found, the quantity actually recovered went far beyond any anticipations which the writer had previously entertained. The following table shows the results:

Table Showing Quantity of Arsenic (As_2O_3) *Found in Hair from Horses in Deer Lodge Valley.* (4)

Animal.	Sample.	When Obtained.	Distance from Smelter.	Parts Per Million.
Filly	Hair from body	June 28, 1906	5.0 miles	460
Filly	Hair from body	July 3, 1906	2.0 miles	605
Horse	Hair from tail	Nov. 4, 1906	1.5 miles	58

The samples from which the first two analyses of the table were made, were of the long hair growing in patches over the surface of the body. The enormous quantity of arsenic in the hair as compared with other organs is shown by the fact that, whereas the hair of the second animal contained 605 parts per million, the liver of the same animal contained but 4.4 parts and the bone 13.2 parts. In the case of the third animal, the hair of

the tail was taken for analysis, and while it contained a large proportion of arsenic as compared with the internal organs, it appears small when compared with the two samples of long hair from the body. This would lead to the suspicion that this hair was long precisely because a large quantity of arsenic had been deposited in it, having had, in its passage to the hair, a special local action on the papillæ, which caused the more rapid growth of the hair, or its retention, as the case may be. The horse, which had 58 parts per million in the hair of the tail, had 6 in the liver, 2.2 in the bones and 1.4 in the kidney. These findings certainly show the importance of a quantitative analysis of the hair in chronic arsenical poisoning.

Harkins and Swain say, referring to these analyses: "The case is more complicated than those investigated in England, since an unknown fraction of the arsenic in the hair was undoubtedly deposited from the atmosphere." This is true; and, unfortunately, it is impossible to determine how large a fraction of the total quantity was deposited directly from the atmosphere and how large a remainder passed through the digestive organs and was carried by the blood to the papillæ of the hair. It is probable, however, that by far the greater quantity reached the hair by way of the blood, and this is confirmed by the much smaller quantity found in the hair from the tail.

The Retention and Accumulation of Arsenic.—The discovery of such large quantities of arsenic in the bones and muscles of animals, as well as in the hair, raises the question of the accumulation of this poison when it is taken into the body daily for a considerable time. Does the arsenic tend to increase in quantity in the body, under such circumstances, until it finally reaches a point where it greatly exceeds the dose ingested daily, and then produces serious or fatal effects, or is an equilibrium established between the intake and the excretion, so that a dose which is at first free from injurious effects continues to be non-injurious for all time? This is an important question, not only as it relates to cases of chronic intoxication such as occurred in the Deer Lodge Valley, but also as it relates to the continued administra-

tion of small doses of arsenic in medical and veterinary practice. Until recently, this question has not received the attention which it merits; and, in general, arsenic has not been looked upon as a cumulative poison, or at most the accumulation has been regarded as insignificant, a few days' intermission or a temporary diminution of the dose being thought sufficient to permit the excretion of all the poison and to make a continuation of the medication safe.

The evidence submitted to the Royal Arsenical Commission directed attention particularly to this question, and, taken with the observations of others in recent years, furnishes a basis for a much clearer idea of the extent and importance of the accumulation of this substance than was formerly entertained. The fact that these observations are not generally accessible, and that they have a direct bearing on the cases under consideration, is sufficient reason for introducing them here with some detail.

Peterson and Haines say(5): "Peculiar features are found in chronic poisoning that have given rise to the theory that arsenic is cumulative. Careful investigation shows that the poison is not stored up in the tissues for such a length of time as are lead and mercury, though the effects appear to accumulate in force and gravity.

"Arsenic is readily diffusible and, passing to the tissues, abides for a few weeks and then is eliminated. The dose may be considerable, yet if the patient lives for three weeks, the arsenic may have entirely disappeared from the soft tissues, but, as Brouardel and Pouchet found, it may still be detected in the bones. On the other hand, cases are recorded where the poison has been found in the liver and bones after two and even six months."

They further say(6): "Hills analyzed the urine for arsenic in 180 cases. * * * In some cases as many as 80 days elapsed before the arsenic disappeared from the urine."

In another reference to the same subject they state: "Arsenic has been detected in the urine ninety-three days after a single

large dose had been administered, causing acute symptoms and having a sequel of paralysis."

These are cases in which arsenic was retained in the body during a long period of time after a single large dose. The question in which we are most interested is, What occurs when smaller doses are administered daily for weeks or months? The evidence submitted to the Royal Arsenical Commission probably comes the nearest to answering this question of any which is at present available.

In this connection, Mann made the following statement(7): "In England, chronic arsenical poisoning, as in the present outbreak, is quite a new matter. A great distinction must be drawn between cases of acute arsenical poisoning which were previously known in this country and these cases of chronic arsenical poisoning; for example, in the acute arsenical poisoning you will not find arsenic in the urine longer than ten, twelve or fourteen days at the outside. I have never found it in acute cases longer than five or six days. It seems to me that the constant taking of small doses causes the arsenic to back up, if I may use the expression, in the tissues. I do not think that it combines in the sense that the other metals do, but more is received than can be eliminated. A certain amount is stored up and it takes time to come away. The general tendency is for the arsenic to get away, judging from the cases I have followed so far, in six or more months, probably, but something like that ("months" is possibly a misprint for "weeks," as the witness states elsewhere that the longest period in which he had found it was 59 days after the patient had ceased drinking beer.—D. E. S.). * * * I should like to point out to the Commission that there is a very thick line to be drawn between acute arsenical poisoning and chronic arsenical poisoning, so far as elimination goes. We have always regarded arsenic as a non-cumulative poison up to now. Cumulative is a relative term, but arsenic lingers in the system much longer than we thought."

The same witness stated (8): "Arsenic was found in the urine 21 days, in another case 32 days, and the longest period

in which I found it was 59 days after the patient had ceased drinking beer."

Kelynack said (9): "It is generally believed that arsenic is excreted rapidly, but our recent experience has conclusively shown that arsenic may act as a cumulative poison."

Luff said(10): "Another lesson probably taught by the epidemic is that the views hitherto held as to arsenic being a non-cumulative poison will probably have to be modified. Some of the symptoms point to the fact that the arsenic must have accumulated, and have been retained in the system for a considerable period of time."

Delepine said (11): "What I have found is that when a very small amount of arsenic is administered daily there seems to be an accumulation. There is an accumulation, because one finds several days after the arsenic has been stopped that there may be in the body a larger amount of arsenic than the daily dose given."

The same witness said with reference to his experiments on rats(12): "Arsenic was found in the tissues of two rats which had ceased to take arsenic for more than 40 days before death. In experiment 1, the amount found was nearly equal to a daily dose. In experiment 6, the amount of arsenic found was 16 times greater than a daily dose. The daily dose in this case was exceedingly small."

Since the older evidence cited shows that arsenic may remain in the tissues a long time after a single large dose is given, and this more recent evidence shows that it may remain and accumulate when daily small doses are taken, we cannot avoid the conclusion that arsenic in either large or small doses may be retained in the tissues. If the doses, either great or small, are repeated daily, it may accumulate so that there will be more in the body at one time than the daily dose given. This being the case, we should not be surprised to find that in a certain number of cases, when arsenic is taken daily, the effect is greater than would be expected from the size of the daily dose. It is a poison, therefore, which cannot be repeated with the same impunity as drugs

which spend their force and are entirely eliminated within a few hours.

In considering the effect of the slow elimination of arsenic as increasing the probability of harmful action when animals ingest moderate doses daily for a long time, it must not be forgotten that in addition to the retention which may occur with the eliminating organs in a normal condition, there is another form of retention due to pathological conditions of the eliminating organs which diminish their permeability. Thus Peterson and Haines (13) tell us that "Organic diseases of the kidney, by retarding elimination, as a rule decidedly increase the effects of most poisons, a dose that would ordinarily not be over large sometimes produces serious results when the person is suffering from renal disorder."

With the greater part of the animals of the Deer Lodge Valley suffering from marked renal disorders, as shown by the microscopical examinations of the writer, it may be assumed that they were more susceptible and suffered from a smaller dose than would similar animals with normal kidneys. That there must, also, have been a great accumulation of arsenic in the tissues seems clear, not only from the analyses of bones and hair cited in this article, but also from the large quantities revealed in the livers of some of the animals, as shown by the table published in the third article of this series. It will be seen by referring to that article that with four animals in the experiments of Harkins and Swain poisoned with large doses of arsenic, and which died of acute poisoning, the maximum quantity recovered from any liver was 12.2 parts per million. A horse which died of acute poisoning in the experiments of the writer (No. 92), and which had been given repeated large doses, carried in its liver 14.8 parts per million. In the livers of Deer Lodge Valley animals were found as much as 31.7, 33.8, 52.5, and 63.12 parts per million, or from two to four times as much as the maximum of acute cases in the experiments. Now, how are we to explain the much greater quantities of arsenic found in the livers of the Deer Lodge Valley animals, some of which had shown no acute

symptoms and were sacrificed for examination, except on the theory that a great part of it had accumulated by the long-continued ingestion of sublethal doses?

With animals carrying such an accumulation of arsenic in the tissues, and with the eliminating function of the kidneys diminished by chronic nephritis, it is evident that only a moderate increase, or perhaps no increase at all, in the daily dose was required to overload the tissues, overcome their power of resistance and bring on acute symptoms or death.

(*To be concluded in the next issue.*)

BUREAU MEN DINE.—The Bureau of Animal Industry employees of South Omaha and their ladies assembled in banquet recently and spent a very pleasant evening. Plates were laid for 120 and a fine five-course supper was served. Dr. Thomas White acted as toastmaster and was also the leading spirit of the banquet. The supper was followed by a program and a general social time. At the following regular monthly meeting of the Bureau of Animal Industry employees it was voted to make the banquet a regular annual affair.

THROUGH the courtesy of Secretary Peter F. Bahnsen, we have had the privilege of examining the questions on the various subjects used by the Board of Veterinary Examiners, State of Georgia, at its last examination for license to practice in that state, which, but for want of space, we should publish in the present number. The rules of the Board demand that no paper shall fail to grade 60 or better, and the general average must not be less than 75. The doctor states that four of the applicants that came before the Board were not graduates of recognized colleges, and they all failed to pass. The following graduates successfully passed the State Board: Dr. Otis Perrin, Kansas City Vet. Col., 1911; Dr. Jesse C. Wright, Kansas City Vet. Col., 1911; Dr. J. M. Jehle, C. V. C., 1911; Dr. S. N. Bradshaw, Ala. Pol. Inst. Vet., 1911; Dr. A. P. Edgerly, Ohio State Vet. Col., 1909; Dr. Jean V. Knapp, Col. State Vet. Col., 1911; Dr. Cecil S. Lemon, Col. State Vet. Col., 1911; Dr. W. M. Burson, Cin. Vet. Col., 1907.

SOME OF THE FEATURES OF SANITARY POLICE WORK AS APPLIED IN THE FEDERAL QUARANTINE SERVICE.*

By R. N. Hickman, Chief of Quarantine Division, B.A.I., Washington, D. C.

Sanitary police work, as related to veterinay science, is to be regarded as the practical application of prophylaxis in connection with the live stock interests of a given section, or of a nation, and therefore constitutes the chief function or office of a quarantine organization, whether it be Municipal, Local, State, or Federal.

The sanitary police work of the United States Bureau of Animal Industry, having reference to the importation of live stock from foreign countries, is under the direction and supervision of the quarantine division of that Bureau, so likewise is the control of the importation of hides and skins, and some of the other animal products, as well as hay, straw, and feed stuffs, all of which are covered by regulations numbered and known for identification as Bureau of Animal Industry orders in the case of animals, hay, straw, and forage, and Treasury Department, Division of Customs, orders in the case of hides, hide cuttings, and parings, or glue stock.

The foregoing represent the main sources through which the contagion or infection of the diseases of live stock threaten us from abroad, and which long ago might have gained entrance with serious results to our great animal industry were it not for the adequacy of our laws and regulations, and the effectiveness with which they are administered. For when the greatness of our maritime commerce with other countries of the world and the immensity of our agricultural area are considered, together

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with the wealth and progressiveness of Americans in matters pertaining to breeds, breeding, and the development of the animal industry, it would seem impossible otherwise that any of the animal plagues and diseases of the old world could have been excluded. Neither rinderpest, sheep pox, nor swine erysipelas have ever gained an entrance to America, nor indeed did the dreaded foot-and-mouth disease in the outbreaks of either 1902 or 1908, through any of the avenues over which the Bureau of Animal Industry has supervision. We say dreaded foot-and-mouth disease not so much on account of the seriousness of the disease to the animals attacked, but on account of its extreme contagiousness and the disaster and demoralization that would result from an economic viewpoint should it ever gain a footing and become disseminated over America.

CONTAGIOUS DISEASES OF ANIMALS IN FOREIGN COUNTRIES.

A number of foreign, particularly European, countries maintain sanitary supervision over their live stock, and issue periodical reports showing the status of contagious diseases of domestic animals. The reports covering last year have been tabulated and the results are shown in a series of tables in the Annual Report of the Bureau for 1910. The problem of controlling foot-and-mouth disease proved, as heretofore, a difficult one in many of the European countries. All of the countries of western, or at least of northwestern Europe, recognize the necessity of adopting very prompt measures of eradication, and these countries were practically free from the disease at the close of the year. Most of them, however, including Great Britain, had to deal with one or more isolated outbreaks, and owing to the prevalence of the disease in central and eastern Europe both Great Britain and Denmark have reported outbreaks during the present year. In England there were outbreaks this year, in March at Chobham, Surrey, and again in July. The prompt destruction of animals and disinfection were effective in the arrest of the disease in the March outbreak, it being confined to the one premises. It was surmised that the infection in this instance was introduced in Russian oats, of which the owner of the farm infected had re-

cently purchased a large quantity, though it was subsequently stated that the Board of Agriculture and Fisheries was absolutely unable to determine the source of the infection. The July outbreak or outbreaks have been the cause of much concern. On July 5 the disease was reported on Bland's farm, Hounslow, County of Middlesex, and two days later on another farm about a quarter of a mile distant. The third outbreak was reported three or four miles farther on, near London. An investigation by the officers of the Board of Agriculture showed that the second and third farms infected was by mediate contagion from the first but another outbreak was reported at Winchelsea, near Rye, in the County of Sussex, on the 17th of July, and on the 19th a number of sheep were found infected, which were pasturing on the marshes on a farm adjoining the Winchelsea farm.

Regarding central and southern Europe, although only Italy and Switzerland were affected during the first part of 1910, the disease later traveled northward with great rapidity and the efforts which were made to prevent its spread proved ineffectual.

Austria-Hungary.

The tables for Austria, Hungary, and Germany, in the previously mentioned Annual Report of the Bureau, give a fair illustration of the extreme contagiousness of foot-and-mouth disease, especially those for Austria and Hungary. These two countries were entirely free from the disease during the first six months of 1910, but it gained a foothold in July and afterwards spread so rapidly that both countries were entirely overrun at the close of the year.

Thus the reports for December show that the year ended with a total of 72,389 farms or premises infected in Austria and Hungary. There was not much change in the status of the other diseases in Austria as compared with 1909, except hog cholera, the outbreaks of which were nearly four times as numerous in the last four months of 1910 as they were during the same period in 1909.

Aside from foot-and-mouth disease in Hungary, the outbreaks of most of the other diseases were considerably less than in 1909. This applies especially to erysipelas of swine. Hog cholera, however, as in the case of Austria, was more prevalent. It has occurred to me frequently since my visit of last spring to Dr. Paul Fischer's hog cholera serum plant of the Ohio State Board of Agriculture, that these countries would find it profitable to take up the Dorset process of immunization.

Belgium and the Netherlands.

Also with regard to foot-and-mouth disease in Belgium and the Netherlands, it is of interest to note that during two years, or a little more, prior to November 18, 1906, the United States Department of Agriculture was permitting the importation of cattle from Belgium and Holland. On the date just mentioned a shipment of brown Swiss cattle left Antwerp for New York. These cattle had been taken from Switzerland to Belgium a little more than six months previously, and kept on a farm a short distance from the port of shipment, in order to meet the requirements of the Department's regulations in the matter of eligibility for certification by the Belgian authorities, cattle not being permitted from Switzerland on account of foot-and-mouth disease in that country. Almost simultaneously with the shipment of these Swiss cattle, Belgium imported the infection of foot-and-mouth disease in some French sheep, which disease, before the end of the following month, December, extended to every province in Belgium, and over the border into Holland, with the result that both countries became overrun with the disease, the official reports showing that Belgium reached in that month (December, 1906) 5,878 cases.

The Netherlands seemed to hold the disease in check until July, 1907, there being 104 cases reported in December, 1906; 175 in January, 1907; 186 in February, none in March and April, 195 in May, and 43 in June, 1907. In July they evidently lost control, as there were 47,398 cases reported for that month,

and 137,243 for August. So it has gone on both in Belgium and the Netherlands, seeming to be under control for a period and then breaking out with fresh vigor, with this summer recording an extensive prevalence of the disease. The manner in which foot-and-mouth disease crops out at widely separated localities, after several months' intermission, would seem to show the possibilities with regard to the virus lurking on premises ready to attack several months after it had been considered to be extinct. For instance, there was no foot-and-mouth disease in the Netherlands in May, 1909; there were then two outbreaks in June, none in July, none in August, and one in September. The country was then free to the end of January, 1910, and arrangements were made to permit an importation of Holstein cattle from the Netherlands. In fact, the permit had been issued, when an outbreak of foot-and-mouth disease was reported as having occurred in February, which necessitated the cancelling of the permit, as our regulations require that the section from which ruminants and swine are exported to the United States shall have been free from infectious and contagious diseases during the six months preceding. The February outbreak occurred in the province of South Holland. There was another in March in the province of Overyssel, and still another each in April and May in Guelderland and South Holland respectively. It will be noted that these are each single outbreaks, and that those occurring in the four successive months were at widely separated points. There was no foot-and-mouth disease reported in the Netherlands from then (May, 1910) until February, 1911, for which latter month 44 outbreaks are reported. There was no foot-and-mouth disease reported in Belgium from May, 1909, to August, 1910, with a record of 1,639 cases for April, 1911, and the last official reports received, *i. e.,* June, 1911, showing a total of 68,763 cases on 4,389 premises. Also, in the Netherlands during the same month (June of this year) the disease is reported as existing on 18,214 premises, affecting every province in the country except one, Groningin.

As previously stated neither of the outbreaks of foot-and-mouth disease which made their appearance in the United States in 1902 and 1906 gained an entrance through any of the sources or channels over which the Bureau of Animal Industry has supervision. The disease has appeared in the United States only on five different occasions, viz.: in 1870, 1880, 1884, 1902, and 1908, and fortunately each of these outbreaks has been promptly stamped out. The methods put into practice since the establishment of the Bureau of Animal Industry permit of no compromise in the handling of such maladies, the prompt slaughter and destruction of diseased and exposed animals alike being required, such slaughter and destruction to be immediately suceeded by thorough disinfection; that is, we aim to eradicate every trace of infection from each premises or locality dealt with. Great Britain and a few other European countries now operate along the same lines, though except in the handling of single or isolated outbreaks on the continent the disease has usually been combated by isolation and quarantine, and it would seem from the consular reports received that in those countries in which the disease exists, and is more or less prevalent much of the time, that they simply quarantine the affected and exposed animals, proceed to infect the latter, treat them in accordance with the indications, and hope there will be no further spread of the disease. In the latter part of June the Agricultural Department received through the Department of State a communication from the American consul at Breslau, Germany, regarding the prevalence of foot-and-mouth disease in Silesia and elsewhere in Germany, in which it was stated that practical farmers are applying the lessons of observation and experience to the handling of cattle stricken with the disease. Knowing that its appearance signifies the certain infection of the entire farm, no matter how carefully the different stalls are isolated from each other, they take steps as soon as a case appears to accelerate the spread of the disease so that it may rapidly run its course. This is done by artificial infection through mixing the feed; taking that contaminated by an animal with a mild form of the disease with a view to trans-

mitting the same mild form to the other cattle. This seems to us a rather primitive method of combating contagious disease. Indeed, I think it will not be claiming too much to state that America set the pace in contagious animal disease eradiçation in its wonderful campaign against pleuro-pneumonia, successfully completed in the spring of 1892, in the thickest of which it was my privilege to have an active part.

The last outbreak of foot-and-mouth disease in America was definitely traced to some calves used to propagate vaccine virus, and the most careful investigations as to the origin of the 1902 outbreak shows it to have had a similar origin. Quite full particulars in this connection may be obtained in Bureau of Animal Industry Circular No. 147, issued June 16, 1909, and entitled, "The Origin of the Recent Outbreak of Foot-and-Mouth Disease in the United States." The first outbreak to occur in America, that of 1870, was introduced by way of Canada, and spread into the New England States and into New York, though the disease at this time appears to have been of a mild type, and the dissemination of the contagion was quite easily arrested. In 1880 there were two or three lots of animals brought to the United States affected with the disease, but there was no extension of the disease from the animals originally affected. In 1884 there was a small outbreak at Portland, Me., from imported animals, which spread to a few herds outside of the quarantine station, but this outbreak was likewise easily controlled because of the small number of animals affected and the limited area covered by the disease. It was in this same year, 1884, under the act of May 29, that the Bureau of Animal Industry was organized, the pleuro-pneumonia campaign inaugurated, and regulations promulgated, with permit, health certificate, and affidavit provisions, which placed importations of live stock under a more complete Governmental sanitary police control.

When the United States came into possession of the Philippine Islands, in the adjustment of affairs with Spain over Cuba, we took up the study of some of the tropical diseases because of the new danger with which we then seemed to be menaced by

returning soldiers, officers, and others desiring to bring animals to the United States from that archipelago. An order was issued by the Secretary of Agriculture, effective December 13, 1901, prohibiting the landing of animals from the Philippine Islands at any of the ports of the United States or its dependencies, as it was soon recognized that most all of the serious communicable diseases of live stock were to be found there in more or less abundance, and owing to the fact of the United States having a climate, somewhere within its vast area, that would seem adapted to the perpetuation of most any kind of an animal disease, should it once gain an entrance and foothold, it was deemed necessary to control or cut off every possible recognized avenue through which the infection of their animal diseases might be introduced, particularly surra and rinderpest. *Surra* could have been properly included in the list of the more serious animal diseases of the Old World, thus far successfully excluded from the live stock of America, and even though the disease did reach our shores in an importation of 51 head of so-called Brahman cattle shipped from Bombay, India, April 27, 1906, it did us no injury because of the manner in which the importation was handled, but on the contrary proved something of a blessing in disguise, as it gave the Bureau actual experience with surra, and served as an additional test of the vigilance and efficiency of our sanitary police service. For the information of members of our association who have not yet seen the Twenty-sixth Annual Report of the Bureau, I would state that this importation was undertaken by Mr. A. P. Borden, executor of the Pierce Estate, Pierce, Texas. It appears that about 31 or 32 years ago, Mr. A. H. Pierce introduced into Southern Texas a number of these so-called Brahman cattle from India, which were successfully crossed on the native cattle, with the result that their progeny were relatively free from ticks, while the native stock in the same pasture would be literally covered with these pests. As a consequence, the Brahman grades thrived under the same conditions, which served to deplete the native stock. The Brahman grades not only withstood the semi-tropical weather conditions

present in the Gulf Coast section, but their sebaceous secretion seemed to be repugnant to insect life, and while the hide of this animal is probably thinner than that of our domestic bovine, it is very tough, as shown by the difficulty experienced in attempting to puncture it with a small trocar and canula or the hypodermic needle. The hair also is very short, another possible reason for these animals not carrying ticks. Through Mr. Borden's representations as to the suitableness of these cattle for the Gulf Coast section, and the importance of procuring stock which, when only one-eighth Brahman, possessed the above-named advantages over their native cattle improved through mixing with pure-bred stock principally by the use of Hereford and Shorthorn bulls, the Secretary of Agriculture consented to permit him to make an importation under precautions, which it was supposed were adequate to protect us against the introduction of any of the diseases of live stock in that country. Dr. William Thompson, a veterinary inspector of the Bureau of Animal Industry, who had served two years in the veterinary service of the Phillipine Islands, was detailed to go to India to inspect the cattle before purchase, inquire into their history, supervise their transfer to the seaboard, and accompany them to the United States. He was directed to exercise the utmost care in making inspections, and to accept no animals from an infected locality, and in the event any infectious disease should be discovered among the animals prior to shipment it was stipulated that the entire number should be considered as exposed, and rejected. On the 31st of March, 1906, Dr. Thompson and Mr. Borden met at Bombay, and proceeded first to Miraji, where 22 very fine bulls of the Kreshna Valley breed were purchased. Six bulls of the Nellore breed were secured from Madras. Other purchases were made at other points in sections reported to be free from rinderpest, surra, contagious pleuro-pneumonia, foot-and-mouth disease, and all other contagious diseases, until there were secured in all 46 bulls, 2 cows, 1 heifer and 2 calves, representing seven different breeds, which were shipped to and accumulated at the agricultural farm at Poona, whence they were transported in cleaned and disinfec-

ted cars to Bombay for their ocean voyage. At Poona microscopic examinations of their blood were made on two different occasions, and as a precautionary measure they were inoculated with anti-rinderpest serum to guard against any possible exposure during loading or detention at Bombay. Blood tests were likewise to have been made, by rabbit inoculations, but unfortunately it was impossible to obtain the rabbits for this purpose at Bombay.

(*To be concluded in the next issue.*)

EXPERIMENTS IN ARMY HORSE BREEDING.—The public generally knows that the Government has outlined a plan to encourage the breeding of horses for the army whereby owners in suitable sections will have the command of service to first-class stallions free, in return for which they agree to give the United States options on resulting foals at a fair price. The plan was taken up as a means to provide a good supply of horses such as the army needs, which, strange as it may seem, is rapidly becoming more and more limited. An appropriation was suggested at the last session of the Sixty-first Congress, but no action was taken, one objection being that the plan was not practical—that farmers would not enter into such agreements with the Government.

Fortunately, funds were available to make an experiment to determine this point. Mr. August Belmont, of New York, presented to the Government two of his best known stallions, Henry of Navarre and Octagon, and the Department of Agriculture placed them at the command of farmers in the vicinity of Front Royal, Virginia, on exactly the terms outlined in the Government plan.

By the approval of the War Department, the price to be paid for the resulting foals at three years of age was $150, and no difficulty whatever was experienced in getting farmers to breed their mares under these terms. About fifty mares were bred, the stallions reaching Virginia somewhat late in the season and Octagon's usefulness being curtailed by a severe attack of distemper.

The interest of the Virginia farmers is keen, and already fifty additional mares have been offered for the season of 1912, and the services of more stallions could easily be utilized if available. —*Rider and Driver.*

ANTHRAX AND TICK FEVER.*

By W. H. Dalrymple, Baton Rouge, La.
(*Of Committee on Veterinary Sanitary Police Measures.*)

Anthrax.—The work of this committee being devoted to Veterinary Sanitary Police Measures, it will not be necessary to take up time in the discussion, in a general way, of either of the topics assigned me, but rather the epizootiological side, more particularly with regard to prevention, and including, of course, sanitation.

Besides, it would seem rather tautological, if you will permit the expression, to make a general report on anthrax, seeing that the subject has been dealt with by this association from time to time, and the papers duly published in the official reports of the proceedings.

And further, there are not only some excellent text-book articles on this disease, but also those from other authentic sources, such as our national Bureau of Animal Industry, some of the state experiment stations, the various professional journals, etc.

In other words, I desire to convey the impression that you are all more or less familiar with anthrax; and it would be more or less a waste of time to try to tell you something you already know.

Hence, I have kept out of this paper a good deal of "filling," and have taken up the sanitary side of the subject almost from the start. This will not only tend to conserve your patience, but at the same time lead to greater brevity.

It may be necessary, however, to mention a few things concerning the bacillus of Duvaine, or the *Bacterium anthracis,* as

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it is the sole cause of our trouble. If this tenacious organism would only perish with its victim under ordinary unsanitary conditions, what a world of anxiety it would save to the veterinary sanitarian whose lot may be cast in those sections of the country where permanent infection exists.

Suffice it to say, then, that Duvaine, in 1863, recognized to be the specific cause of anthrax, or charbon, the "little sticks" which Pollender, of Wipperfurth, stated previously he had found in the blood of cattle affected with anthrax.

It was the late Dr. Koch, however, who gave us more light regarding the development of the spores, and their transformation into rods.

The germ is generally classed as an aerobic, rod-shaped, non-motile, spore-bearing organism; and in one or other of its stages may exist intracorporeally, or, under favorable conditions, outside of the body.

I am rather inclined to doubt, however, the absolute accuracy of the statement made by some of the earlier investigators, that spores have been brought, from deeply buried anthrax carcasses, by earthworms to the surface of the ground. In the first place, the anaerobic conditions surrounding the infection in the deeply buried carcass would tend to hasten the degeneration and death of the aerobic organisms before it was likely for earthworms to come in contact with them, and afterwards raise them from the lower depths to be ultimately spread upon the surface in their castings. And, further, although the depth to which this annelidian representative descends varies according to conditions of temperature and moisture, in the summer it is found near the surface and in winter just below the frost-line, and varying in depth according to the depth of that line.

Hence, I would rather give credence to the opinion that the infection on the surface, which has been credited to the upward freight-carrying ability of the earthworm, had never been buried at all, but had been left there through the medium of infected discharges, either rectal, nasal, or other, and overlooked in the final obsequies.

On the contrary, I am of the opinion that if all the natural orifices of the cadaver are effectually closed with tampons of tow, or lint-cotton, saturated with some effective germicidal fluid to prevent the escape, and destroy the infectivity, of any possible discharge, and the carcass interred, with or without lime, the chances for infection being left at that point will be extremely small.

In short, if the *whole* carcass, including its infected tissues, discharges, etc., is carefully buried, the risk of future infection from that source will be reduced to the minimum, and without much fear of its being brought to the surface from the bowels of the earth in the bowels of the earthworm.

The size of the rod is usually given at from 5 to 8 microns long, by about 1 to 2 microns broad, with square-cut ends.

In bouillon cultures the rods grow into long, flexible filaments, made up of separate segments which are readily distinguishable in the stained specimen.

The organism grows freely on a variety of culture media at a suitable temperature, say from 20° to 38° C. It is said to cease to grow below 12° C. and above 45° C.

The rods are said to survive a temperature of 45° C., but are destroyed in ten minutes at 100° C.

The spores are much more resistant than the rods, and are said to have survived 130° C. And when old and dry, may require several hours at 140° C. to sterilize them.

The short description I have here given of this organism may be more or less classical—when taken from the blood soon after death.

The problem of identification becomes more difficult, however, with the age of the material to be examined, due to contamination with septic forms, some of which have a certain resemblance to the anthrax bacillus, and also on account of degenerative changes in the germ itself.

Then, again, some methods of staining are not so satisfactory as others, on account of their shrivelling action on the protoplasm.

It would seem that the methylene-blue method, first described by Sir John McFadyean, I believe, has the greatest diagnostic value—staining the undistorted rod-protoplasm blue, while the capsule assumes a rose-pink hue.

That this organism may, and does, under favorable conditions of heat, moisture and nutritive material, vegetate outside of the animal body, I hardly think there can be any question. For, according to Koch, the bacteria grow readily upon potato, infusions of hay, mashed barley, mashed wheat, and numerous other substances—all the conditions being favorable; and at the Louisiana Experiment Station Dr. Howard J. Milks, a member of this association, and at the time assistant veterinarian and bacteriologist of the station, inoculated with spores such media as alfalfa, Bermuda grass, vetch, clover, stringbean, etc. with resultant growths of anthrax bacteria.

From this it may readily be inferred how difficult a problem it is to deal effectively with anthrax infection especially in the warmer sections of the United States, where, although laws may be altogether adequate, sufficient appropriations are not made by state legislatures in order to properly enforce the sanitary provisions of such laws.

True, conditions have much improved in this respect, and are improving as time goes on. But, unfortunately, for want of adequate state appropriations in the infected commonwealths of the Lower Mississippi Valley to enforce the necessary sanitary regulations, with regard to proper disposition of carcasses especially, and required by law at that, infection is being added to year by year.

The channels of infection in the animal are chiefly by ingestion and external inoculation, although it is possible the respiratory tract may occasionally be added, in the event of dried forage being contaminated with spores and the latter inhaled, much as in the case of the wool sorter or the mattress maker, with dried spores from wool or horse-hair.

My own experience seems to have been that the initial case, or cases, was usually some animal grazing over pasture pre-

viously infected through the blood and tissues of an anthrax carcass left carelessly exposed. Then, the outbreak continued through the medium of innumerable myriads of tabanids, or horseflies, which had been feeding upon the infected blood and, with soiled probosces, inoculating other animals externally—in my section of the country, at least.

But while these tabanids (and I expect we may include some other flies and mosquitoes) are, in my judgment, responsible for widely spreading the infection, when once they obtain it from an animal in the last stages of the disease, or even shortly afterwards, so long as the blood remains warm and fluid enough to be imbibed by them, there are numerous other media of transmission.

At the annual meeting of the United States Live Stock Sanitary Association, held in Chicago two years ago, there was a resolution adopted, if I mistake not, recommending the repeal of all state laws protecting the turkey buzzard and carrion crow, which frequently scavenge together. Some states in the South have, I think, already done so; and I am firmly of the opinion that, in order to circumscribe the infection of anthrax, in some of our Gulf States at least, these birds will either have to go, or their tastes educated to more delicate morsels than the tissues of the anthrax cadaver.

On the presumption that any agent which comes in contact with anthrax-infected blood, and can mechanically carry it on the exposed parts of the body, is capable of transporting anthrax infection and creating fresh foci of the disease, the buzzard has naturally been looked upon as one of the guiltiest of these agents; and to make a test of the matter and, if possible, authenticate the presumption, some experiments have, during the present year, been conducted and are being conducted by Dr. Harry Norris, assistant veterinarian and bacteriologist of the Louisiana station, a brief summary of which is as follows:

On March 1, anthrax spores from four agar-slopes were fed to a buzzard in captivity. Twenty dilution plates were prepared from cultures made from the excreta, but no anthrax was found.

On the 7th, 8th and 9th, spores were fed to a buzzard, the excreta collected, and thirty plates prepared, but with negative results.

On the 20th, a rabbit which had died of anthrax was fed to a buzzard. On the 21st, twenty plates were made from the excreta; on the 22d, twenty more plates were prepared, but with negative results.

On the 30th, a rabbit dead of anthrax was fed. An hour and a half later the feet and bill of the buzzard were scraped, and cultures made from the scrapings. Vomited material which the buzzard had emitted was also cultured and all showed anthrax organisms.

On April 1, a rabbit was fed to the buzzard at 11 a. m.

Forty-eight hours later, cultures were prepared from the feet and bill and all showed anthrax.

On the 8th, another rabbit was fed, and anthrax infection was found on the feet and bill thirty-two hours afterwards.

On May 23, a rabbit was fed to the buzzard, and twenty hours later the bird was killed. Cultures were made from the mouth to the rectum, with the result that anthrax was found in the crop and in the gizzard.

On June 4, a similar experiment was conducted. The buzzard was destroyed nineteen hours later, but with negative results.

On July 11 a buzzard was fed spores inoculated into meat. The bird was killed nineteen hours later, but with negative results.

On the 17th, the previous experiment was repeated with similar results.

Incidentally it might be here mentioned, that both common houseflies and ants that had been feeding upon the anthrax carcasses of the rabbits used in the experiments were carefully caught on agar-plates, resulting in profuse cultures of anthrax organisms.

The chief deductions to be made from these few practical experiments, which were, I think, as close to natural conditions as possible, are:

(1) That, in these experiments at least, no anthrax infection was found in the excreta of a buzzard fed animals dead of the disease.

(2) That buzzards, after feeding upon anthrax flesh, have their bills and feet contaminated with anthrax infection, which they may carry considerable distances and create fresh foci of the disease.

(3) That, after feeding upon anthrax flesh, the vomitus from the buzzard, which is frequently emitted after a full meal, may be infected, and may also produce fresh centres of the disease.

(4) That the housefly and the ant, and probably other forms of insect life, after feeding upon or otherwise coming in contact with anthrax flesh, may become extremely dangerous as carriers of the infection.

Other agencies through which infection may be carried are, of course, dogs, hogs, etc., which have had the opportunity to feed upon anthrax flesh.

Streams, also, into which the virulent blood may have been washed, or contaminated directly through carcasses being thrown into them.

Occasionally, I fear, spores may be introduced and spread through fertilizers composed of animal tissues not sufficiently exposed to heat to thoroughly sterilize them. I recollect a fertilizer of this kind coming to the chemical laboratory of our experiment station to be analyzed in accordance with our state law. This material was labeled a "foreign tankage," and was found to contain nothing but leather (not a very available form of nitrogen for plant food), wool, and shoddy. It was not tested bacteriologically, and I do not know that it was infected. The chances are, however, that this so-called fertilizer came from one or other of the countries to the south of us, where anthrax frequently exists, but not much sanitation.

I merely cite the above as an instance where animal tissues, in the form of fertilizer, might sometimes be the means of introducing and spreading anthrax infection over a wide area without even being suspected. The sale of this particular shipment of "foreign tankage," so-called, was prohibited on our local market.

Then, foodstuffs doubtless do occasionally harbor and convey spores of anthrax. I have had at least two instances in my own experience, and there are others recorded. In my own cases, which occurred a number of years ago, although not verified by bacteriological examination of the foodstuffs, the circumstantial evidence was so pointed in each case as to dispel any doubt in the matter.

There are, doubtless, other media of transmission which could be mentioned, but I shall allude to just one more, viz.—hides.

Carcasses are often skinned for their hides by the unwary during extensive outbreaks of anthrax. Of course, the gravity of the undertaking is not realized by those who do it, and the result often is carbuncular anthrax in human beings, with, frequently, death following. I have known of this procedure in my own state, and have witnessed some of the unfortunate human victims.

Such hides as referred to are usually shipped somewhere to market, and sometimes conveyed to the shipping point on the wagons of public carriers or transfer companies. The consignees may be either intra- or inter-state; and if the latter, it brings up the point of the interstate shipment of infection-carrying articles of commerce, which, I believe, ought to come within the purview of our authorities at the National Capital.

Brought down to its ultimate analysis, the most militant factor against the successful work of the veterinary sanitarian in dealing with anthrax infection is *the infected carcass.*

Artificial methods of prevention are good, and necessary, and highly to be commended. But when the victim succumbs to the disease, all interest in it is lost, so far as the owner is concerned.

State sanitary legislation may be adequate, as is the case in some of our worst-infected commonwealths, but the gravity of the situation and the necessity for adequate appropriations do not appeal to the average state legislator, who generally knows little and probably cares less concerning matters of this kind, with the result that strict sanitary measures, especially with reference to the careful disposal of the charbonous cadaver, cannot be enforced because of the lack of sufficient money to effectively carry out the provisions of the law on the subject.

This is certainly an anomalous condition of affairs, and applies, I expect, in more states than one, if all the facts were known.

It takes *money* to deal, even reasonably effectively, with anthrax infection. And, where that infection is so widespread, as it is in some parts of the Lower Mississippi Valley, it is, I am afraid, going to take a larger sum of money than at present appears in store, from local or state sources at least, to make any appreciable effect upon the present unsavory situation.

A great deal of good has been accomplished by the use of protective inoculation in the past; but this is mainly voluntary, with us at least, on the part of the owner, making the work erratic rather than regular, which militates against a larger success.

If vaccination, where required, was made compulsory, as it should be, and in the hands of state live-stock sanitary authorities or competent veterinary practitioners, the number of cases would, undoubtedly, be very much reduced from year to year.

It is probable, also, that the use of anti-anthrax serum to protect, temporarily, animals during a present outbreak, may accomplish similar results. But these, although extremely valuable, are merely adjuncts in the general sanitary scheme for the prevention, control and eradication of anthrax infection. Some stock owners will vaccinate regularly; others only when an outbreak of the disease on their own or a contiguous place frightens them into it. And yet, neither of them may realize the importance of seeing to it that a carcass, seething with organismal

life for future infection, is carefully disposed of and placed beyond the reach of the various agencies that are capable of transporting infection from it.

It is largely due to ignorance, or indifference, or both, on the part of the people themselves in not asking, and the state legislatures in not granting, the necessary wherewithal for general state live-stock sanitation, that so much difficulty is experienced in dealing adequately with the anthrax carcass.

I dislike to appear to play the role of the pessimist, as I must admit to having witnessed some slight improvement, from a professional point of view, in my part of the country. Yet, after an experience of quite a number of years in a section where anthrax infection does exist to some extent, I am almost forced to the conclusion, notwithstanding the excellent provisions of some of our state live-stock sanitary laws, that the proper sanitary control of this disease, as it stands to-day, is more than is likely to be accomplished in the near future, if dependent upon the inadequate appropriations made, or likely soon to be made, by at least some of the infected states. And, on account of its bearing upon interstate traffic in disease-carrying articles of commerce, it is a question in my mind whether it is not a matter to be dealt with by, or at least receive the assistance of, the Federal authorities, in order to attempt to place a check on the ravages and loss occasioned almost annually by this fatal, infectious malady.

(*To be concluded in the next issue.*)

VETERINARY PRACTICE NOT ON DECLINE IN BROOKLYN.—Dr. W. J. McKinney, Brooklyn, N. Y., has purchased the lot at the rear of his hospital, which will enable him to add thirty more stalls to his establishment, a fact which indicates that veterinary practice is not on the decline in the "city of churches."

BROTHER PRACTITIONERS WELCOME.—Dr. Chas. H. Beere, of Waterbury, Conn., writes, "I have lately installed at my hospital in this city a 'Chicago Veterinary Operating Table,' which I find entirely satisfactory, and offer its use at any time to the other members of the profession."

THE IMPORTANCE OF HOG CHOLERA AND THE PRODUCTION OF HOG CHOLERA SERUM.*

By F. A. Bolser, V.S., New Castle, Ind.

The importance of "Hog Cholera" and the production of hog cholera serum to the live stock interests of the world will be readily seen when one considers that according to the year book of the United States Department of Agriculture for 1910. there were millions of dollars lost from the greatest enemy to swine. There has always been doubt as to whether the highly infectious disease, hog cholera, existed in different states or whether the reported outbreaks of cholera were not caused by some dietary condition as, for instance, Moore has pointed out in the case of feeding swill which contained large quantities of powdered soap.

However, after the discovery that a filterable virus is the cause of the epizootic disease and not the bacillus of hog cholera, it was suggested that some of the outbreaks of apparently infectious diseases of swine from which this latter organism could not be isolated might be due to the filterable virus. With this in view, historically, it is interesting to note that hog cholera has existed in this country for a long time. It was first reported in Ohio in 1833 and was thought by American authorities to have been imported from Europe. Scientists on that continent, however, denied its existence in Europe until long after its existence here. The absence of positive diagnosis at that time failed to make clear in which country it originated. It is reasonably certain, however, that Ohio was the first state to be infected. During the next twenty years after its first appearance there were over ninety outbreaks divided among several states

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and furnishing centers from which the infection has been carried to practically every state in the Union.

Dr. Geo. Sutton, of Aurora, Ind., made the first report upon the disease in 1853. This was followed by reports by E. M. Snow, of Providence, R. I., in 1861, Dr. James Law, Ithaca, N. Y., in 1875, and Dr. Detmers in 1877. Dr. Law's report contains the first accurate and complete description of the disease. The work of these men covered the symptoms of the disease and the post-mortem appearance of the organs of the animals that had died of it, in fact, all that could be learned from field observation alone.

In 1878, Congress made an appropriation for the investigation of swine diseases. Nine men were appointed for the investigation of 1878, and these for a period of two months only. Consequently little was accomplished. The researches of these men were made in the field and various measures applicable to the control of epizootic diseases were tried. The results of these investigations were summed up as follows in a publication of the Bureau of Animal Industry, 1889, Hog Cholera:

1. Swine diseases were found destructive in the most widely separated districts of the country.

2. The symptoms and post-mortem lesions were similar to those described by Sutton, Snow, Law and others.

3. No evidence was discovered to show that there was more than one disease which prevailed as an epizootic.

4. It was believed that the outbreaks were due to a contagion and that the disease was communicable.

5. The remedies tested were either without effect or of doubtful value in the treatment of affected animals or guarding against the contagion.

Of the nine investigators only Law and Detmers retained their appointment more than two months. These men did considerable laboratory work. Law made inoculations into rabbits, rats and sheep and seemed to establish the communicability of the disease he investigated. Detmers, by the aid of the microscope, thought that he discovered the cause of the disease and named

the organism *Bacillus suis*. Both of these conclusions were in error but pointed out the need of bacteriological research and careful laboratory work as the only means of determining the cause and prevention of the disease. Law and Detmers continued their investigation for the Department of Agriculture in 1879. In 1880 Salmon was added. Law devoted much of his time to the production of a vaccine by attenuation of the virus or cause of the disease. In this he was unsuccessful. During this time Detmers continued his investigation with the microscope. During the next four years little was done in investigation because it was understood that it had been carried about as far as possible under the methods then employed and because of a lack of facilities for and clear methods of bacteriological research.

In 1885 it was announced that Salmon and Smith had discovered the cause of the disease. This was determined as due to a motile rod, to which the name has been given *Bacillus choleræ suis* or hog cholera bacillus. These investigators showed that this organism was found in the organs of most of the animals which they examined that died of cholera. Further, they could produce symptoms similar to hog cholera and lesions, in many cases, indistinguishable from those of animals that had contracted the disease naturally. They were also able to recover the bacillus from the animals which had died as the result of the inoculation.

In 1886, Smith described an entirely different infectious disease of swine due to an organism belonging to the present Septicaemia Haemorrhagica group. Accordingly, it was considered that there were two distinct infectious diseases; hog cholera in which the lesions were largely in the digestive tract, and swine plague in which the lungs were mostly involved. In many outbreaks they were able to find both diseases present and to recover both organisms from the same animal.

The results of Salmon and Smith were confirmed by scientists of this and other countries and it was generally conceded

that there were two contagious diseases of swine, namely hog cholera and swine plague.

Since *Bacillus cholerae suis* was announced as being the cause of hog cholera, the work has been largely to find a vaccine or serum which would serve as a preventive of the disease. Various vaccines and sera were tried but none of the preparations gave satisfactory or practical results. It was not until twenty years later that de Schweinitz was led to the suspicion that *Bacillus choleræ suis* was not the cause of the epizootic form of the disease. He noticed that although hog cholera was very contagious and spreads readily to other members of the herd when once it is introduced, yet when an animal was injected with pure cultures of *Bacillus choleræ suis,* in many cases the animal would become sick and die from the effects of the injection, but other animals associating with it would remain well. He also found that it was difficult to produce cholera by subcutaneous injections of cultures of the hog cholera bacillus, while the injection of some of the blood of a sick animal subcutaneously into a sound one would produce the disease. Other reasons were that although made immune to pure cultures of hog cholera bacillus, animals were by no means immune when exposed to animals sick with the cholera.

These facts led to further investigation. In 1903, de Schweinitz and Dorset reported that *Bacillus choleræ suis* was not the specific cause of the epizootic disease, but that the cause was a filterable virus or one so small that it could be passed through the finest porcelain filter. It might be well to add a word relative to the term "filterable virus." There are certain diseases, for instance, rinderpest and food-and-mouth disease, that are highly contagious, and which are due to invisible organisms or viruses present in the blood and fluids of the body. These viruses are so small that they can be passed through the finest porcelain filter and are invisible even with our strongest microscopes.

As a result of the experiments published in 1895, it was determined that the filterable virus is the real cause of the epizootic

disease of the swine; that the hog cholera and swine plague bacteria are, so far as the epizootics are concerned, secondary invaders. The fact, however, must not be lost sight of that *Bacillus cholerœ suis* and *Bacterium septicæmia hæmorrhagica* are the cause of certain diseases of the swine, and in many outbreaks they exert considerable influence as to the manifestations of the disease.

Means by Which the Infection Is Spread. Hog cholera may be spread from a single center of infection in many ways. One of the most prevalent is the purchase of a hog from an infected herd and placing it in a sound one. It is also spread to some extent by taking the sows from a sound herd to an infected herd for service. This has occurred once in our experience in which we had a clear history. The infection may also be carried from one farm to another upon the attendant's shoes or upon the wheels of wagons driven through the infected territory. Horses and cattle, though not capable of contracting the disease, may carry the infection from one place to another upon their feet. This also holds good in the case of dogs feeding upon carcasses dead of the disease. Furthermore, it may be carried down a stream of water from pollution higher up. Pigeons are dangerous carriers also.

Period of Incubation.—The period of incubation varies from a few days to two or even three weeks. This depends a great deal upon the method of exposure, virulence of the virus, and resistance of the animals exposed. Young and pampered animals are usually more susceptible and have the more acute form of the disease. A short period of incubation usually means a virulent type of the disease. As in the case of most infections, the virus of hog cholera is more virulent in the earlier part of the outbreak of the disease and may become so weak that the resistant animals may not become affected at all.

Symptoms. The symptoms of hog cholera are not very characteristic. Fever is usually present and in animals that are coming down with the disease, which have not as yet shown any symptoms of sickness, the temperature may be several degrees

above normal. Frequently it is subnormal in the last stages of the disease. Soon after being attacked the animal loses appetite, becomes weak and may have convulsions. In the early part of the attack, the young and very fat animals may succumb without showing any symptoms of the disease. Diarrhoea may be present and usually follows constipation, although constipation sometimes persists through the disease.

The symptoms vary somewhat with the virulence of the outbreak and the resistance of the animal attacked. If the virulence is high and the resistance low the acute form is seen. In this type of the disease, the animal shows fever, dullness, stiffness, soreness, tremors, weakness and loss of appetite. It does not move unless made to do so; in general there is great depression. The eyes are inflamed and the lids gummed with the secretions. Red patches usually appear upon the skin, especially in the region of the ears, lower jaw, abdomen and inside of the legs. Sometimes the redness is diffuse, covering the entire regions mentioned. Before death this may turn to a purplish color. Coughing, rapid breathing, and other symptoms of respiratory derangement may be present but usually these symptoms are not pronounced until shortly before death.

In the chronic type of the disease about the same symptoms are exhibited as in the acute except that the illness may last several weeks or months, during which there is the usual weakness, loss of appetite, inflammation of the eyes, and usually profuse diarrhoea. If these cases recover they are usually of little value to the owner. It will be noticed from the above description that there are no symptoms characteristic of the disease. However, if an animal or two have died and then after an interval of a week or ten days others become affected in a similar manner, there is sufficient grounds for suspecting the presence of hog cholera.

Post-Mortem Appearances.—There may be reddish or purplish spots upon the skin or the entire region mentioned under symptoms may be colored. Petechiae may be present upon the surface of the heart and occasionally upon the pericardium

and lungs. Frequently pneumonia is present but is not so characteristic as the small hemorrhages. In acute cases the spleen is usually enlarged, dark colored, soft, filled with blood, and may show hemorrhages beneath its capsule. In chronic cases this enlargement is not noticed and the color is often lighter than normal.

The lymph glands in the inguinal region are swollen and red or even dark in color in the acute form of the disease. Those in other parts of the body, mesenteric, angles of the jaw, etc., may be affected in a similar manner. These legions are not often found in the chronic cases. The kidneys in the acute cases are usually the seat of small hemorrhages. To observe the condition of the kidneys it is necesary to remove the capsule. If the kidneys are slit open hemorrhages of a similar nature may be seen on their inner surfaces. The color of the kidneys is usually darker than normal and the hemorrhages may vary in size from a mere point up to the size of a pin head.

Sometimes petechiae are found on the serous side of the stomach and small intestines. The mucosae of these organs may also show hemorrhages. The large intestine, however, is usually the seat of extensive lesions. In the acute form of the disease hemorrhages may be present on both surfaces of this organ. Erosion of the mucous membrane is also common. The mucosa may be blood stained and the contents of the bowel blood stained from the extravasation of blood. In the chronic form of the disease, the so-called "button ulcers" may be found. These ulcers are usually found in the caecum upon or near the ileo-caecal valve and are quite characteristic of the disease. They are circular, hard, yellow in color, with a darker greenish yellow centre, raised distinctly above the healthy mucous membrane. They vary in size from mere points to an inch in diameter and are so numerous in some cases that large portions of the organ are destroyed. If the ulcers are found diagnosis can be made fairly accurate, although there is no other disease in this country in which the petechiae are found in the heart, lungs, kidneys and other organs.

Any or all of the above described lesions may be found in an animal dead of cholera, but only an occasional animal exhibits all the lesions. For instance, it is practically impossible to find the button-like ulcers in the acute form of the disease and but rarely are the hemorrhages seen in the chronic type.

DIAGNOSIS.—Before diagnosing a disease as hog cholera there are a few important factors one should bear in bind. In the first place, is the disease contagious? That is, can it be spread from one animal to another? Then the symptoms and post-mortem lesions should be considered. It is impossible to get a good idea relative to the disease from these observations, but in order to prove conclusively that the disease is hog cholera, it is necessary to produce the disease in a sound animal by inoculating it with some of the filtered blood of a dead or very sick animal.

The disease must be distinguished from sickness due to improper feeding, especially in cases of swill or garbage fed animals, as it has been shown that powdered soaps used in washing dishes may cause a disease which resembles cholera. Of course, disorders due to dietary conditions would not spread as an epizootic, while hog cholera would most likely spread throughout the neighborhood. There are so very few other diseases which might be confused with cholera that time will not be taken to discuss them.

(*To be concluded in the next issue.*)

FIFTIETH ANNIVERSARY, A. V. M. A.—The first official meeting of the Committee on the Fiftieth Anniversary of the American Veterinary Medical Association was held in New York City on the evening of January 17, with Dr. John F. Winchester, of Lawrence, Mass., presiding, and Dr. W. Horace Hoskins, of Philadelphia, Pa., recording. Other members of the committee present were: Dean Coates, of the Veterinary Department of New York University, and Drs. Ackerman, Berns, Cochran, Ellis, Gill, Hollingworth and Kingston. Outlines of the working plan were drawn, sub-committees appointed and the work of preparation for the greatest national event in the history of veterinary medicine in America begun.

COMPARISON OF PERIODIC OPHTHALMIA OF EQUINES WITH GLAUCOMA OF MAN.*

By L. C. Tiffany, Springfield, Ill.

This paper is presented with the avowal that the writer is not possessed of profound or superior knowledge of the anatomy, physiology or pathological changes which affect the eye of either equines or man, but is presented for the purpose of stimulating others to the acquirement of such knowledge, and particularly concerning the condition so long termed "periodic ophthalmia" in equines.

Several years ago, when engaged in practice in Jacksonville, Ill., this subject engaged much of my thoughts, as the cases were numerous and the patients often very valuable. It was my good fortune to have the acquaintance of one of the most accomplished ophthalmologists in this country at that time, and now, perhaps, in the world, and with him I frequently conversed upon the subject. He advised me to procure some literature upon the eye and to study the matter thoroughly.

This was obtained, and some time afterward it was evident to me that there was an almost or quite complete analogy between a serious affliction of man and that which destroyed the sight of so many of our patients, although much more common in the latter. I refer to glaucoma, and its symptoms, together with its predisposing causes, appear identical with periodic ophthalmia. There is also a hereditary predisposition in both cases.

Those of us who have observed the eye of the horse critically have noticed that we are able to detect those animals whose eyes are predisposed to the condition under consideration. We notice the wrinkled upper lid, produced, probably, by the hypermetropic

* Read at 29th Annual Meeting. I. S. V. M. A., at Chicago, December 8, 1911.

eye underneath. The hypermetropic eye is present and is congenital.

Comparison of the symptoms in both glaucoma and periodic ophthalmia discloses the fact that the attacks are periodical and very sudden; often the first attack is without warning, especially in our patients. As the symptoms in the latter are so well known, it is unimportant to describe them here, and will only say that they seem practically identical with those of glaucoma.

In both we have the hypermetropic eye with increased intra-ocular tension. The one being the important predisposing cause and the other the immediate cause of glaucoma.

The large, deep eye seems exempt from recurrent or periodic ophthalmia, but the small, shallow one is the kind in which we expect to find it sooner or later. In both glaucoma and periodic ophthalmia the period of attack is not usual in early life, but perhaps the latter makes it appearance at a comparatively earlier period than does glaucoma in man. This, however, may possibly be accounted for in the method of feeding equines; for corn-fed animals appear to be more subject than do those who are fed on less fat-producing grains. Again, plethoric animals, or those of that type, are more often affected than are those of the lighter breeds, or non-lymphatic type.

Much of which follows is quoted from the excellent work by Dr. Ernst Fuchs, Professor of Ophthalmology in the University of Vienna:

"Easy as it is to deduce the symptoms of glaucoma from the elevation of tension, it is quite difficult to account for the origin of the latter and thus explain the essential nature of glaucoma.

"Of the many theories which have hitherto been propounded upon this subject, no single one is satisfactory in every respect. Only the most important of them will be adduced here, and that mainly with the object of showing upon what circumstances increase in tension in general depends.

"The intra-ocular pressure is determined by the relation between the internal capacity and the elasticity of the envelopes

of the eyeball, on the one hand, and the amount of its contents on the other.

"If the latter factor increases or the former factors diminish, the pressure is elevated. An alteration of the internal capacity of the envelopes of the eyeball cannot be brought into account for the increase of pressure, since the volume of the envelopes, as a whole, is unalterable. In advanced life, to be sure, the sclera is not only more rigid, but also a little contracted; but the diminuation in volume so caused is extremely slight. We must, therefore, look for the cause of the elevation of tension in an increase in amount of the contents of the eyeball, the envelopes being at the same time not sufficiently elastic to adapt themselves to their increased contents without marked heightening of the pressure. Now the amount of matter contained in the eyeball depends, on the one hand, upon the amount of ocular fluids which are constantly being secreted by the blood-vessels, and, on the other hand, upon the quantity of fluid which leaves the eye through the lymph passages; it corresponds, that is, to the relation between inflow and outflow, between secretion and excretion.

"In the normal eye this relation always remains about the same; since with any increase of the inflow the liquid, which is now subjected to an increased pressure, also leaves the eye more quickly, so that the normal pressure is soon restored. For any permanent increase of pressure to occur, a disturbance of this self-regulating action must be present. Such a disturbance can be looked for only in the excretory apparatus, for so long as this works normally, every increase in the amount of fluid would soon be compensated for by increase in the outflow. But if the outflow is interfered with, a normal or even a diminished inflow of liquid must lead ultimately to over-distention of the eyeball. Consequently the explanation that is accepted by most authorities at the present time to account for the increase of tension, namely, the theory of Kneis and Weber, presupposes a disturbance of the outflow. The most important path for the outflow lies in the sinus of the anterior chamber and passes through the ligamentum

pectinatum into Schlemm's canal. It is at this spot that the obstacle must be looked for. Such an obstacle is produced in the following way: A genuine glaucoma develops only in an eye which has a *predisposition* to it. This predisposition depends on insufficient spatial relations. These affect the eye as a whole and particularly the region of the anterior and posterior chambers. They are afforded by: (1) smallness of the eye as a whole; (2) shallowness of the anterior chamber; (3) unusual size of the ciliary processes; (4) disproportionate size of the lens.

"Such relations appertain to the hypermetropic eye when it has become old. The hypermetropic eye is smaller than the normal eye, its anterior chamber is shallower, and its ciliary processes are unusually large because the ciliary muscle is hypertrophied on account of the constantly maintained accommodation. Yet the lens in such eyes is no smaller than it is in the emmetropic eye. And, as regards the lens, there is the additional fact that it increases in size progressively with advancing age, and yet the eye itself grows no larger, so that ultimately the lens becomes too big for the eye. Hence the hypermetrope does not get glaucoma as long as he is young, but gets it only when with advancing age his lens has become too large, for then the space between the lens and the ciliary processes becomes too narrow. It is through this circumlental space that the lymph flows from the vitreous to aqueous cavity. When this space is contracted the lymph becomes dammed up in the vitreous. The latter consequently increases in volume, pushes the lens and iris forward, and thus makes the anterior chamber still shallower. An actual increase of tension, however, is not yet present in such an eye because the sinus of the chamber is yet present, so that an increased volume of aqueous, such as would correspond to the increased volume of the vitreous, can still be discharged exteriorly. An actual attack of glaucoma does not occur in the predisposed eye until this passage of outflow is blocked. This takes place from closure of the sinus of the chamber and is pro-

duced by some one of the causes which, we know, can excite an attack of glaucoma.

"The exciting causes of this sort, that we know, are disturbances in the circulation of the blood and dilatation of the pupil.

"Let us, to begin with, consider the first case, a stasis of blood in the veins of the greater circulation. In the eye such a stasis makes itself apparently principally in the ciliary processes which are extremely rich in veins. The ciliary processes then swell up and, as the circumlental space is so narrow, soon extend to the margin of the lens.

"In this way the communication between the vitreous cavity and the anterior chamber is still more interfered with, and the vitreous, owing to the retention of lymph, swells up to a still greater extent than before and pushes forward still more strongly upon the swollen ciliary processes. Since the latter are already abutting against the margin of the lens, they can give way toward the front only. They swell forward into the anterior chamber until they reach the root of the iris and jam the latter forward against the cornea-sclera. But in so doing the iris shuts up the passage of outflow for the aqueous, and, hence, the intraocular pressure at once necessarily rises. In this way a glaucomatous attack is brought about.

"If the swelling of the ciliary processes soon recedes, or the pupil soon contracts, the iris returns to its former position, the sinus of the chamber becomes free, the tension falls, and the attack, being in this case simply a prodromal one, passes off. If, on the other hand, a return to the normal condition does not take place soon, the root of the iris becomes agglutinated to the corneo-sclera, and out of this agglutination an adhesion afterward develops, a return to the normal conditions has become impossible, and the glaucoma is permanent.

"TREATMENT OF PRIMARY GLAUCOMA.—Glaucoma passed for an incurable disease until Von Graefe discovered the curative action of iridectomy. Afterward still other methods of operating were devised, none of which, however, has been able to displace iridectomy. In this operation the wound should be in the sclera,

not in the cornea; and the excision of the iris should be carried to the ciliary margin and be made as broad as possible. Incarceration of the iris in the wound after the operation should be avoided by careful reposition. If possible, the iridectomy should be made upward, so that the colomboma may be covered by the upper lid, and not cause trouble through the dazzling due to irregular refraction.

As regards the time for performing the operation, it is best to operate as soon as possible.

"MEDICINAL TREATMENT.—The miotics, eserine and pilocarpine, are powerful agents in combating increase in tension. They act only when the iris is capable of contracting satisfactorily; hence, in old cases of glaucoma with a complete atrophic iris they are useless. Their action is accounted for upon the supposition that by contraction of the pupil the iris is stretched in a radial direction, and so is drawn away from the wall of the eyeball to which it has been applied, so that the sinus of the chamber again becomes free. The effects of miotics are only transient and cannot cure glaucoma.

"In the prodromal stage of glaucoma, miotics are employed to cut short the attacks. If a miotic is instilled at the commencement of an attack, it comes to an end quickly, and we can thus, for a long time, prevent the prodromal attack from rising into an acute inflammatory attack. Nevertheless, we should not prolong the prodromal stage in this way until excavation of the optic nerve, with permanent impairment of sight, sets in."

From a comparison of these strikingly similar conditions the conclusion arose that periodic ophthalmia in equines is glaucoma, and experimental surgical operations were undertaken by the ophthalmologist first referred to in order to demonstrate the correctness of such conclusion. Unfortunately, however, the operator was a very busy man, and soon my time was occupied with another branch of the profession and only two subjects were treated. The first was a four-year-old trotting bred stallion afflicted in both eyes for several months. Before the operation was begun the surgeon insisted that the animal be castrated, and

although the owner was not present, this was done and the operation of iridectomy immediately followed on both eyes.

The owner promised to keep me informed as to the result, which he faithfully performed, and he reported at intervals. This animal did not have a recurrence of the trouble up to the time of his death, from an accident, some nine months later.

The other operation was also on a stallion seven years old, and was not successful. From results in these two cases we should not form definite conclusions, but from the fact that one of them appeared successful, it would seem that we are justified in continuing experiments along this line.

My memory frequently brings to light an account which I read in my days at Toronto, of a physician in Scotland who attempted something about the eye of a horse subject to attacks of periodic ophthalmia and that the cornea was accidentally punctured permitting the aqueous humor to escape and that the trouble did not recur. This, if true, should add some weight to the theory here advanced.

In glaucoma of man the operation of iridectomy gives good results if performed early, and perhaps similar results might follow the operation in the horse. Also, this operation on the predisposed animal with the hypermetropic eye, before he has been the subject of an attack, might be beneficial in a prophylactic way.

THE VETERINARY CONFERENCE AT THE NEW YORK STATE VETERINARY COLLEGE January 10 and 11 was a great satisfaction to Director Moore, who is always best pleased when he is doing somebody some good, and at the conference he and his colleagues did a lot of people a lot of good. More than two hundred veterinarians from all over the State assembled there. An account of what work was done at the conference will be published in our next issue.

THE ARMY VETERINARY BILL bears House No. 16843; write it on the sweat-band of your hat with pen or indelible pencil, so that you are sure to have it with you when you call on or 'phone your Congressman.

DYSENTERY IN CALVES.*

By H. L. Sommer, V.M.D., Fort Atkinson, Wis.

Dysentery in calves is a subject that has been described numerous times by great authorities, but I shall beg your indulgence if I touch this subject rather roughly, and should I not express myself as technically as I may desire, I crave the pardon of the profession, for my shortcomings will be due to my inexperience rather than the lack of painstaking.

The form of dysentery I will describe is the one which attacks calves one to two days old. Due to the severity of the attack, there are very few chances of a calf's recovery, unless strenuous treatment is given immediately.

The premonitory symptoms are hardly recognized, as the calf seems to look well when dropped and performs its function as regularly as a healthy one. After twelve to twenty-four hours, and sometimes even after thirty-six hours, the calf begins to scour an odorless, light yellow liquid. When this stage of the disease is reached, the calf looks dumpish, sleeps with its head on its flank, refuses feed, breathes fast; the excreta changes its color to a deeper yellow and in some cases becomes brown. The excreta eventually develop a fetid odor, constantly oozing out of the anus, and in some cases it comes out with great force and accompanied by flatus. At this stage the calf refuses all feed and unless vigorous treatment, as I will describe below, is given, it will die.

The cause of this disease is yet unknown to me. The bacteriological results of a post mortem held by Dr. Hadley, of the Wisconsin Agricultural College, can be summed up by saying that the swab obtained from the heart's blood revealed a bacillus

* Presented to the Keystone Veterinary Medical Society, Philadelphia, Pa.

similar to the colon bacillus, but it did not prove pathogenic to rabbits.

To prove that this form of scours is not the ordinary "calf scours," we isolated a cow and her stall was previously washed and scrubbed with a carbolic acid solution and whitewashed, 1/500 per cent. of the whitewash being bichloride of mercury. Fresh bedding was supplied that had never come in contact with any of the cows infected. The hind parts of the cow were thoroughly washed with antiseptics and every precaution taken, but the disease was reproduced in the calf.

Another cow was isolated in a barn some distance from the other barn and the foregoing method of applying antiseptics was followed, but the disease made its appearance.

Ordinary medicinal treatment for calf scours failed to check the dysentery, and Drs. Alexander and Hadley, of the Wisconsin Agricultural College, who were called for consultation, advised the trial of a polyvalent dysentery serum manufactured in a German laboratory owned by the Pasteur Institute.

My first experiments with the above serum began at the farm of a former governor of Wisconsin, Hon. W. D. Hoard, who owns a pure-bred herd of Guernsey cattle at Fort Atkinson, Wis.

The following experiments were carried on with five calves of different ages and diversity of attacks:

Case No. 1.—Called at 5 p. m., November 21. Calf born 8 p. m., November 18, developed scours after twenty-four hours. When seen, calf was prostrated, sleeping with head in flank. Respiration, 28; temperature, 101.8° F.; pulse weak and rapid. Refused food for twelve hours. Had several loose passages of a brown color and fetid odor. Injected 20 c.c. of polyvalent dysentery serum.

November 22, 9 a. m.—Calf looked brighter; would get up and accept milk offered to which 5 gr. of powdered opium had been added. Respiration, 22; temperature, 101.4° F.; pulse strong and bounding. 5 p. m.: Calf bright; had one loose pass-

age since injection, yellow in color. Temperature, respiration and pulse unchanged.

November 23, 9 a. m.—Sleeps and scours again; looks droopy and dejected. Conjunctiva highly injected. Respiration, 24; temperature, 102° F.; pulse strong and rapid. Feels chilly and shivers. Injected 10 c.c. of polyvalent dysentery serum. 5 p. m.: Calf seems better. Holds head up more. Conjunctiva still injected. Has had several passages yellowish white in color, liquid in consistency. Pulse strong; temperature, 102.4° F.; respiration, 24. Sleeps all the time. Weak, cannot stand up. Shivers.

November 24, 9 a. m.—Looks bright, jumps around in stall. Has had no passages whatever. Pulse strong; temperature, 102° F. Is very thin. Has had milk with 5 gr. of powdered opium. Responds to external stimuli readily and lays down cautiously. Has more strength in his legs. 5 p. m.: Looks bright, rests easy, holds head up high. Has had no passage yet. Takes food out of pail offered with 5 gr. powdered opium. Temperature, 102.2° F.; respiration, 22; pulse strong.

November 25, 9 a. m.—Is very bright. Takes food offered and eats greedily. Has had two passages during the night, normal consistency, yellow in color and devoid of offensive odor. Walks around stall and holds head up naturally. Temperature, 101.6° F.; pulse strong and full; respiration, 20. Recovered.

Case No. 2.—Born 6 a. m., November 19.

November 21, 5 p. m.—Has been well for forty-eight hours, but developed scours after that. Does not care to suckle mother; sleeps. Temperature, 101.8° F.; respiration, 24; pulse weak and fast. Injected 10 c.c. of polyvalent dysentery serum.

November 22, 9 a. m.—Sleeps; scours dark yellow in color, very offensive odor. Does not suckle mother. Temperature, 102° F.; respiration, 30; pulse weak. Injected 10 c.c. polyvalent dysentery serum. Separated from mother. 5 p. m.: Quiet, sleeps; has had one passage of a thicker consistency than before. Has had 5 gr. of opium in milk offered in a pail and

accepted. Pulse strong; temperature, 102° F.; respiration, 24. Not strong enough to stand up.

November 23, 9 a. m.—Still lies down. Has had one passage, normal consistency; light yellow in color. Pulse strong; temperature, 101.2° F. Does not seem very strong. Looks emaciated. Accepted milk with 5 gr. powdered opium. Dull, does not respond.

November 24, 9 a. m.—Lies down yet. No great change since yesterday. 5 p. m.: Is bright, refuses food and had to be fed with milk bottle. Temperature, 102.4° F.; respiration, 20; pulse strong.

November 25, 9 a. m.—Has had several passages during the night. Yellow in color and natural consistency. Stands up, stretches, walks around stall. Feces has no odor. Temperature, 102° F.; pulse strong. Recovered.

Case No. 3.—November 21, 5 p. m. Twenty-four hours old. Has been well and lively. Temperature, 102.4° F.; pulse strong; respiration, 24. Injected 10 c.c. polyvalent dysentery serum.

November 22, 9 a. m.—Calf developed scours. Discharges are thicker than No. 1 and No. 2. Yellow in color and slimy. Very faint odor detected. Pulse, temperature and respiration unchanged. Willing to feed. Received 5 gr. powdered opium with milk and accepted. Separated him from cow.

November 23, 5 p. m.—Lively. Keeps head up smartly. Ears erect, conjunctiva normal. Pulse strong; temperature, 103.2° F.; respiration, 20. Has had no passages since this morning which were thicker than yesterday.

November 24, 9 a. m.—Looks bright. Walks around stall. No passages whatever. External coat natural. Eyes bright and responds to calling. Pulse strong and full. Temperature, 103; respiration, 20. 5 p. m.: No change; no passage. Eats well.

November 25, 9 a. m.—Very bright. Had two passages during the night. Natural consistency and yellow in color. Bleats and plays around in stall. Recovered.

CASE No. 4.—Born 5 p. m., November 25. Born in an isolated barn stall which had been thoroughly disinfected and whitewashed with a 1/500 bichloride whitewash. Unused bedding has been spread and carbolic acid solution sprinkled on bedding. Cow's genitalia have been washed antiseptically for two days previous to parturition. Calf very large and healthy. Navel has been disinfected and tied.

November 26, 5 p. m.—Calf does not look very bright. A little redness noticed on anus. No signs of scours.

November 27, 9 a. m.—Calf developed scours. Injected only 5 c.c. of polyvalent dysentery serum. Discharges are yellow in color and of soft consistency, coming out with great force. Suckles well, looks bright. Temperature, 102° F.; respiration, 24; pulse strong and fast. Separated from mother.

November 28, 9 a. m.—Sours badly. Sleeps all the time. Refused food. Temperature, 101.8° F.; respiration, 28; pulse feeble. Injected 10 c.c. of polyvalent dysentery serum. 5 p. m.: Calf seems lively, no passages. Temperature, 102.2° F.; respiration, 24; pulse stronger.

November 29, 9 a. m.—Calf lively; accepted food offered in pail with 5 gr. powdered opium. Has had one passage, yellow in color and thicker consistency. No odor. Recovered.

CASE No. 5.—November 27. Calf born 6 a. m. in common cow barn, where Nos. 1, 2 and 3 were born. Calf a weakling. At 9 a. m. injected 10 c.c. polyvalent dysentery serum.

November 28, 9 a. m.—No dysentery developed. Eats well and sleeps much. 5 p. m.: Has had one passage of natural consistency, yellow in color. Recovered.

For lack of space I shall not mention other cases, but I can say that Case No. 1, which was so severe when treatment was given that it has remained stunted and is growing very slowly, while the calves treated soon after birth have made splendid recovery and are growing naturally. I may also state that Case No. 1 has developed pneumonia after four weeks' recovery, and is under treatment now for this affliction of which I will write in another article as soon as I collect more data.

In conclusion I may say that a calf given an immunization

dose of polyvalent dysentery serum (which is 10 c.c. and not less) immediately after it is born will not develop this dysentery. Those cases in which less than 10 c.c. have been injected develop a temporary immunity which does not last long, and have to be injected with the therapeutic dose afterwards, which is 20 c.c. Money and time will be saved by injecting 10 c.c. of the serum right at the start.

The serum, I am informed, is produced in the same manner as is all other true serums, viz.: from horses that have received repeated injections of the bacilli.

The same laboratory manufacturing the polyvalent dysentery serum also manufactures a germ-free extract of the dysenteric bacilli, which is used in connection with the polyvalent serum in conferring active immunity; it is claimed, will also be conferred on the unborn calf.

Both Baebenroth and Shupp, of Germany, have experimented with these serums and have used the simultaneous treatment, viz.: the immunization of the calf in utero, claiming very good results.

Just what changes undergo in the body as soon as the serum has been injected is not very clear to me. But according to the rise in temperature and the coloration of excreta discharged by the animal after the injection, I assume that it either increases the phagocytic power of the blood or it neutralizes the toxæmia produced by bacterial action or both. Should I be enabled to make a further study of this disease, and facilitated to make a bacteriological examination of the blood during the entire course of the disease, I shall subsequently report more definite data.

Undoubtedly the disease exists in utero and the calf is born with it. Just why the disease does not manifest itself immediately after birth or at the same time, I assume that certain conditions are necessary for the development of the disease.

As the germ-free extract is not as yet in existence in this country, upon its arrival I shall try to immunize the unborn calves and report my work to you hereafter.

Suffice it to say that, so far, I have found the polyvalent dysentery serum a good immunizing, as well as a reliable curative agent, and recommend it to the gentlemen in the profession to give it a thorough trial.

ADMINISTRATION AND COMMAND IN CANADIAN ARMY VETERINARY SERVICE.—The officer administrating the Canadian Army Veterinary Corps shall be the director of transport and supplies. The principal veterinary officer of a command or independent district may be appointed from the regimental lists of the C. P. A. V. C. or C. A. V. C. or from the regimental veterinary service.

DUTIES.—Any officers holding the appointment of principal veterinary officer shall be responsible to the O. C. the command or independent district for the administration of the Canadian Army Veterinary Service, and shall command the C. A. V. Corps within the command or independent district. The commanding officer of the C. P. A. V. C. in a command or independent district shall be the senior C. P. A. V. C. officer of the detachment detailed for duty in the command or independent district.

DUTIES.—Any C. O. of the C. P. A. V. C. shall distribute the personnel of the C. P. A. V. C. allotted to the command or independent district by the O. A. C. A. V. C. as circumstances may require.

STORES.—Veterinary stores in commands or independent districts will be under the charge of P. V. C.

QUALIFICATIONS FOR CANADIAN ARMY VETERINARY CORPS.—Candidates for admission to the Canadian Army Veterinary Corps must make a written application to the officer commanding the command or independent district on M. F. B. 237. The minimum age of candidates is 21 years and the maximum 35 years, except in very special cases or on urgent occasions, when the latter limit may be exceeded. Candidates will not be accepted unless in the opinion of the Minister in Militia Council they are in all respects suitable to hold commissions in the active militia of Canada. Every candidate for a commission must be a graduate of a recognized veterinary college, and must be recommended by the P. V. O. of the command or independent district. Candidates on appointment shall be given the rank of veterinary lieutenant, but shall be required to undergo a qualifying examination within two years of their appointment.

(*Continued on page* 685.)

THE PROBABLE INFLUENCE OF THE OPEN WATER TROUGH IN THE SPREAD OF GLANDERS.*

By A. T. Kinsley, M.S., D.V.S., Kansas City, Mo.

The control of glanders has concerned practically all civilized countries for several centuries. Sanitary regulations for the control of this disease have been modified from time to time in accordance with the newly acquired knowledge of the *Bacterium mallei,* which was positively identified in 1882. Experiments conducted by various investigators have thrown much light on the microbiology of the *Bacterium mallei,* and particularly upon those characteristics which are of prime importance in the sanitary control of glanders.

The general principles of the control of glanders in different localities are similar, but many of the details may differ because of variation of the factors concerned in the spread of this disease. Thus the control of glanders in rural communities involves the same principles, but it is not as difficult and does not involve the same details as the control of this disease in cities. With the present knowledge of the microbiology of the *Bacterium mallei,* glanders should be relatively easily controlled.

The control of glanders, like the control of any infectious disease, resolves itself into a clear understanding of three things: first, the length of time that the pathogenic organisms retain their virulence outside of the animal body; second, the source of infection and channel of entrance of the infectious agent; and third, the avenues of elimination of the infection from the animal body. The first and third actors mentioned will not here be discussed.

In general, bacteria gain entrance into the animal body either through the skin or through the mucous membrane of the diges-

* Presented at the Fifteenth Annual Meeting of the United States Live Stock Sanitary Association, Chicago, December, 1911.

tive tube, respiratory channels, genito-urinary system, or the conjunctival mucous membrane. The most important channel of entrance of the *Bacterium mallei* is still a disputed point, and many experiments, some valuable and some valueless, have been conducted to prove the most frequent channel of entrance of this micro-organism into the animal body. The *Bacterium mallei* gains entrance to the tissues of the body, either through the mucosa of the digestive or respiratory tracts, skin or ocular mucous membrane. The disputed point is, "Which is the most frequent channel of entrance?" It is possible that variation of the surrounding conditions may be responsible for the variation of the most frequent channel of entrance.

In referring to different authors, one finds varying opinions as to the most frequent channel of entrance.

Virborg, in 1793, recognized ingestion glanders. Simonds, Renault and Bouley produced glanders in horses by giving them water contaminated with the *Bacterium mallei*. Schütz, Nocard and McFayden transmitted glanders to horses proven to be free of infection by mallein testing, by introducing the *Bacterium mallei* directly into the stomach.

Friedberger and Frohner hold the view that the most frequent channel of entrance is through the respiratory tract.

"Inoculation in a skin wound or abrasion is the most effective mode of transmission, but the virus undoubtedly enters in certain cases with the air, food or water, or by the accidental lodgment of a speck of the virus on the mucosa of the eye, nose or other natural opening. Through the healthy mucosa the bacillus may enter, * * * Skin, in its healthy state, is usually resistant, but Babes has conveyed infection by rubbing with virus mixed with vaseline * * *. There is ample evidence that primary lesions appear not only in the skin and nasal mucous membrane, but also in the bronchi, intestines and other parts" (Law).

"I long ago arrived at the conviction that not only is infection possible by ingestion, but that this mode of introducing the poison is by far the most common" (Hunting).

From limited observations the writer is of the opinion that the open water trough is a source of infection and that animals do become infected by the ingestion of water contaminated with the discharges of glandered animals, as well as by contact with glandered horses while drinking, by licking discharges of glandered horses from the margin of the drinking fountain and by coughing and sneezing, thus forcibly carrying infected discharges from diseased to healthy horses.

The percentage of horses infected that drink at public watering fountains probably depends upon the type of fountain. To substantiate the foregoing views, the following data are presented:

Dr. S. H. Ward, of the Live Stock Sanitary Board of Minnesota, kindly supplied the facts and figures for St. Paul and Minneapolis:

Year.	St. Paul.	Minneapolis.
1904	59	117
1905	51	110
1906	71	117*a*
1907	34	48
1908	15	13
1909	4	5
1910	8	7
1911	0	7*b*

a—(Fountains closed.)
b—(Up to the present time.)

A year represents the time from August 1 of one year to July 31 of the following year.

From the above table it is noted that glanders was quite prevalent in St. Paul and Minneapolis until the closing of the drinking fountains in 1906. Since that time the number of cases has diminished materially, there being only four cases reported in St. Paul and five in Minneapolis in 1909. Seven of the eight

cases in 1910 in St. Paul, according to Dr. Ward, were due to the fact that during this time glanders was discovered in a feed barn where over 120 horses were tested, of which 7 reacted and were destroyed. In Minneapolis during 1910 and 1911, the majority of horses killed were reactors found on testing horses in transit to other states.

Dr. D. F. Luckey, State Veterinarian of Missouri, and Dr. R. C. Moore, Deputy State Veterinarian, of Kansas City, Mo., kindly supplied the following data:

Year.	Kansas City.	State.	Total.
1896	2	30	32
1897	0	22	22
1898	0	20	20
1899	0	16	16
1900	0	28	28
1901	18	47	59
1902	113	47	160

Year.	Kansas City.	St. Louis.	St. Joseph.	Out State.	Total.
1903	296	10	1	56	363
1904	83	5	3	101	192
1905	69	4	0	24	97
1906	53	23	0	37	113
1907	78	14	0	27	119
1908	84	37	10	49	180
1909	67	23	0	26	116
1910	86	16	0	4	106
1911	58	12	4	22	96

Number of cases in Kansas City from 1896 to 1911, 995.

Number of cases in rest of state from 1896 to 1911, 624.

Number of cases in Kansas City, Mo., from 1901 to 1911, 993.

Number of cases in rest of state from 1901 to 1911, 408.

A year in the above tables is from December 1 to November 31, inclusive.

On reviewing this data, it seems that at first sight that no definite conclusions can be drawn; however, on an analysis of the various factors, this data is of considerable value. The first portion of this report, from 1896 to 1902, perhaps is not very accurate, as the efforts to eradicate glanders was not systematically applied. It is noted that there were 101 out-state cases in 1904. This was due to an extensive outbreak in a grading camp in which fifty-four horses and mules were found to be affected with glanders and were destroyed. The reason for the large number of cases in Kansas City in 1903 is explained by the fact that during June and July of this year many local veterinarians were employed to make a barn-to-barn canvass and examine each horse individually. During these two months over one hundred cases of glanders were officially diagnosed and destroyed; further, it may be stated that immediately following this canvass the public watering troughs were closed and remained closed until April, 1904, when they were again thrown open to the public use through the efforts of the Humane Society. During March and April, 1904, no cases of glanders were reported. During 1905 and 1906, the fountains were closed periodically, and it was noted that within six weeks after these fountains were closed the number of cases of glanders diminished. From 1907 to 1910 the watering fountains were left open most of the time and glanders in Kansas City was probably as widespread as in 1903, although the table does not so indicate. It was found that many cases of glanders were sent direct to the desiccating plant without being reported to the state, there being in some months as many as forty or fifty cases of glanders disposed of by this means, probably more than three hundred during the year. The

fountains were closed during 1910, and although from the above table there seems to have been an increase in the number of cases of glanders, this is explained by the fact that the members of the Team Owners' Association were active in locating and reporting all cases of suspected glanders, hence the official record includes practically all cases which developed during the year. The authorities have been led to believe that the cases of glanders reported the last year represent quite accurately the number of cases that appeared in Kansas City during that time. It is interesting to note that although St. Louis has more than double the population of Kansas City, Mo., relatively few cases of glanders have been reported from that city in spite of the fact that they have open drinking fountains, but the St. Louis fountains are of a different type than those used in Kansas City. The fountains that were in use in Kansas City were about four feet high and were relatively small and shallow, had flaring margins, and were not more than three feet in diameter. The size of the fountain facilitated contact between different horses when they were being watered as well as preventing a very great dilution of the discharges of horses drinking at the fountain, and the flaring margins favored the accumulation of discharges, three conditions which favor transmitting the infection to the horses watered at these fountains. The drinking fountains in St. Louis are found distributed over the city, are large, in some instances being as much as eighteen feet in diameter, three or four feet deep, and having perpendicular sides. These large tanks are an efficient means of diluting the discharges contaminated with the *B. mallei,* and the large tank also prevents contact with other horses drinking on the opposite side. The perpendicular walls do not favor accumulation of discharges.

The number of the cases of glanders in St. Paul, Minneapolis and Kansas City is apparently significant, and although these facts should be of some value in determining whether the water fountain is a factor to be considered in preventing the dissemination of glanders.

THE GENERAL PRACTITIONER OF VETERINARY MEDICINE IN LIVE STOCK SANITARY CONTROL WORK.*

AN ADDRESS BY DR. E. M. NIGHBERT, OF THE UNITED STATES BUREAU OF ANIMAL INDUSTRY, ATLANTA, GA.

It is with a good deal of pleasure that I have this opportunity for the first time to appear before the Georgia Veterinary Medical Association. One in my position has the opportunity of being on the outside, so to speak, which brings to clear view the veterinary profession of various sections and localities. It is with much pride that I am able to state that the veterinary profession has improved in every way everywhere I have been.

The factors bringing about this great improvement and uplift and progress are, knowledge and education. Everything to-day is on a higher standard of perfection. These higher standards have been necessary in order that efficiency and qualifications may be assured. Knowledge is a thorough comprehension of what we have to deal with, while education is the fundamental principle necessary before accuracy and success will follow.

Ancient history reveals that practice of the veterinary art was plainly depicted on Egyptian frescoes, representing the administration to ailments of oxen and other animals years before the Christian era. Since that time the establishment of the profession of veterinary science has continued as civilization progressed and developed into fixed and definite governments.

In studying and thinking of the ancient development of our great profession, I cannot help but come to the conclusion that the main object in view, then as now, was to prevent the dissemination of the various animal plagues that proved a menace to the animal industry and the people of those days.

* Delivered before the Fifth Annual Meeting of the Georgia State Veterinary Medical Association, December 21, 1911.

In A. D. 69, Columella and Dolus Mendicius are mentioned as men of great influence in their profession at that time and highly efficient in the control of animal diseases. In A. D. 400, Vegetius Renatus plainly described sanitary measures in dealing with a serious cattle disease.

The profession of veterinary science is builded upon sound facts and a high principle; she has proven to be an absolute necessity in ancient and modern times. Modern times have placed a greater responsibility upon the practitioner, the municipal, state and national veterinarian—in fact, all connected with the profession, including the teachers and research workers. All are conscious of the public eye and responsibility of safe-guarding the nation's greatest necessity, the live-stock industry, against disease. Modern times have brought about rapid transit facilities for the movement of live stock, and legal measures controlling such movement. These measures have proven necessary for the protection of the public health and the health of the animal industry of the various states.

No law nor a few officers of the law of this nature are capable of accomplishing the results intended without the co-operation of the public, and especially the veterinary profession. It is here where the general practitioner may play an important part, because he is on the ground in close association with owners of animals who are interested in whatever sanitary measures affect their business.

To-day I am speaking from two viewpoints, namely: the veterinary profession as a practitioner, and from the position of a sanitary officer.

I believe it is fair to make this statement, because I have had long experience in both, devoting all my time and energy. I am sorry for but one thing, the mistakes made. Experience has completely convinced me that a practitioner is not in a position to proficiently conduct a practice and execute sanitary laws at the same time, no matter how well he may be qualified. The true sanitary officer builds in his make-up a great conservation principle; he has the welfare of the animal industry and the

public in mind with each act; he looks beyond the present and does not expect extra remuneration for each service rendered. In short, the sanitary officer is a public servant. The general practitioner, on the other hand, is a professional business man; his aim is to take care of what business comes his way and to be ever on the lookout for new business. His clients are his friends and counselors, and he is his friend's counselor should occasion arise necessitating the enforcement of sanitary measures on the live-stock property of such persons. Therefore, the general practitioner may be of a great advantage or disadvantage in live-stock sanitary control work. Every man may have a hobby, but a hobby that is very closely connected with the main avocation or business of a person has not in my experience been a success. To illustrate: The inexperienced graduate generally emerges from college with insufficient funds to equip himself for practice. He may seek a salaried position, expecting to develop a practice on the side, then one or the other, or both, suffers failure, and the public complains and the profession is condemned.

Forty-two states to-day have laws requiring health certificates for animals entering such states. The general practitioner is largely depended upon to safeguard such states in accordance with law against dangerous and communicable diseases of animals. Many thanks for such laws, because, in addition to the protection against disease that may result, the law has been the means of picking out the deceptive and dishonest person who willfully and knowingly makes a false report, no matter what his position may be.

In dealing with live-stock sanitary measures, certain fixed and definite rules are laid down for guidance; such rules are adopted after long experience and consideration by those best qualified on every phase of the subject. The laity and the unscrupulous person of position may not consider these laws seriously.

You will admit there must be a minimum and maximum deviation in executing laws and regulations of this nature. To

go further either way means failure to accomplish the real intent and purpose of the fixed scientific rule. For instance, in applying the tuberculin test, a test that is not questioned as to its accuracy and reliability when properly applied, a test that is demanded by forty-two states and nearly all enlightened governments. Why should a qualified person fail in applying this test accurately and with satisfactory results? If the test fails, it is willful and intentional on the part of the owner or person applying it, or ignorance of the mode of application.

The application of hog cholera serum, one of the greatest discoveries of to-day, the first precaution we read—it must be applied by a skillful hand, preferably a qualified veterinarian. Think of it, gentlemen, the responsibility that rests with you, the great position of trust, representing millions of dollars. Can you not afford to be honest, skillful and scientific? Qualifications, practicability and honesty must be uppermost in the minds of the profession in dealing with this great problem of live-stock sanitary control work, because the farm valuation of animals in this country represents to-day two and a quarter billion of dollars.

No problem pertaining to the diseases of live stock, which has proven a menace to the industry, has been too great for the American veterinarian and the live-stock husbandman to master or formulate measures to suppress or control.

The eradication of the cattle fever tick from this great Southland is the greatest work ever undertaken for an agricultural people in all the annals of time. If the general practitioner does not believe in this work, or that it cannot be done, it is because he has failed to keep step with scientific progress and the fixed and definite plans back of the movement. This great work, I am glad to inform you, is now so deeply rooted that failure is not considered. This work is a success now and will continue to succeed until completed. It started with the cattle owner on the farm; he freed his premises of this disease-transmitting parasite; the county started and freed itself; the state started and the nation started to push this work to completion. In the

past six years one hundred and forty thousand square miles of territory have been freed of this trouble and the road is now open for safe and profitable development of the cattle industry in the most favored section of the nation.

The veterinary profession is greatly indebted to the private practitioner; we are all in need of each other. The practitioner depends upon the men in the laboratory and in the field of research and the sanitarians for facts and a principle to guide them. Without this close relationship and co-operation and exchange of facts and experiences, little headway could be made.

I want to emphasize another point or two. Honesty and sincerity of purpose. It is a great blessing to be conscientious in our work; it will equal in results the skill and tact of any man. You have no scientific secrets that are worth the snap of the finger, unless it has been technically investigated, tried and confirmed by the profession and the scientists of the world. A scientific medical fact, to be of value even to one's self, must be known to the profession. To illustrate, all we have to do is to look into the history of scientific discovery of recent years and we see what Cooper Curtice, Theobald Smith, Kilborne, and Salmon, gave to the scientific world in the discovery of the cattle tick and its connection with disease. This discovery opened the great field of research on parasites of high and low origin and has cleared the way to some of the greatest scientific achievements of man.

I want to impress you of how small and insignificant we are in the professional world alone and how little can be accomplished single handed.

Your association has accomplished much, but you have still greater things to do and you should keep in mind concerted thought and action, and that the great plan of our veterinary institutions and associations and the definite rules and principles laid down for general practice and the execution of general live-stock sanitary control work were not made by one lone, selfish man.

DO OUR DEMEANOR AND EQUIPMENT DISTINGUISH US AS PROFESSIONAL MEN WITH MEN OF OTHER PROFESSIONS? *

By Walter R. Pick, Veterinarian First United States Cavalry, Boise Barracks, Idaho.

When first asked by your secretary to read a paper at this meeting, I begged off, giving as an excuse the uncertainty of my being able to attend, but after thinking the matter over it occurred to me that your society was small, composed of only a few members, and that each one would have to do his part in order that each meeting should be a success, giving each member new food for thought and inspiring each practitioner returning to his clients to do better work and to maintain a dignity commensurate to the social and professional standing to which his chosen profession demands of him. It is my intense interest in the social and professional standing that a veterinarian should aspire to that prompts me to take up part of your valuable time at this meeting. I think the army veterinarian has this question placed before him more forcibly than any other branch of our profession; his associates are educated gentlemen and he will be received as just what he individually is and not necessarily as an educated gentleman, as many other callings in life places a man until he is found to be otherwise.

There is no denying that our profession has been under a ban for years, and why? It is because so many of the men representing us do not practice or aspire to the role of refined, professional men; and until our profession as a whole does this, we will be classified individually and the veterinary profession at large will be the loser. It is the duty of every veterinarian at all times to maintain towards each other a professional dignity, due gentlemen of the same vocation in life; critical remarks

* Read before the Idaho Association of Veterinary Graduates, October, 1911.

of a brother practitioner in the presence of the laity, or an attempt to discredit his professional ability, reflects more seriously upon the one who makes them than upon the colleague attacked, and far more than to either is the serious injury done to the profession at large; for no individual, society or profession is respected by the public more than he or it respects itself; and if we treat each other with disrespect, how can we expect the community or state in which we practice to regard us, or our vocation, with greater distinction than we practice towards ourselves? If our colleague has been guilty of an unprofessional act, the state society is the proper place for the matter to be brought up and discussed and not among the public; and right here, gentlemen, is where I want to emphasize the necessity of every qualified practitioner in the state becoming a member of the state association, for in unity there is strength, and if all are members no individual could afford to be in disrepute with his state association.

We should be proud of the wonderful progress made in the practice of veterinary medicine during the past few years. We find many of our colleagues marching shoulder to shoulder with the best of the sister profession, giving to the community in which he lives, and to the profession at large, services not gauged by dollars and cents, and receiving in return not only a satisfactory monetary consideration, but the respect and gratitude of his community and profession. This should be the aspiration of all veterinarians.

How can we best lay the foundation upon which to build a successful career?

The colleges at which we graduate are responsible for our technical and theoretical qualifications, but we ourselves are responsible for the manner in which we display them. I believe it the duty of every veterinarian to present as good a personal appearance as any professional man he meets; his private office should be as neat and as well furnished; his dispensary as clean and as well equipped as becomes a successful practitioner; his hospital should be an example of what a sanitary, up-to-date

stable should be; for are we not supposed to advise and educate our clients in stable construction and sanitation, and if we as veterinarians do not practice it at home, how can we expect our clients to put any faith in us or what we say?

Not long ago, while our squadron was on the march from Sequoia National Park to San Francisco, California, our quartermaster had occasion to go ahead of the column to find a camp site; upon making inquiries, he was referred to a veterinarian who met him with his machine, and after finding a suitable camp site returned to his hospital. The officer, telling me about it afterward, said it was the best-kept stable he was ever in; that his office and dispensary was as well furnished and equipped as any M. D.'s; and I remarked to him, "Why shouldn't it be?" I relate this to show what a good appearance means to the observing public. Such practitioners are paving the way for equal recognition with other professional men and are stamping out the old term of "horse doctor."

We of the army, I believe, feel the lack of proper place and equipment for the performance of our duty more than any of you, for we have in a great many cases very inadequate accommodations furnished us. I am glad to say, however, that we have a few posts with well-equipped hospitals, and I am pleased to state that the officers of the mounted branches of the service are recognizing and acknowledging the efficient work being done at these posts by the veterinarians in charge, and we are in hopes that these good results and reports will in time bring us the proper recognition.

Gentlemen, let us examine ourselves thoroughly. Are we keeping pace with the rapid strides of progress made in our profession? I sometimes think, when I read the advance work being done by men of our profession, that I am only a drone.

Your chosen state has a wonderful future; the completion of the great irrigation projects now under construction will place Idaho in the forefront of agricultural districts; her climate is conducive to the development of a great and profitable stock industry, and with this development will arise sundry and com-

plex sanitary questions which only the educated veterinarian can solve. Is the veterinary profession of the state of Idaho so establishing itself with its clients and state officials, daily demonstrating their ability to cope with the sanitary needs of the state, that they will seek your advice and abide by your judgment?

I know that the veterinarians of the state of Idaho compare favorably with those of any state in the Union, but the day has come when the veterinarian is not merely a medicine giver but a man versed in agricultural economics and an authority on questions pertaining thereto. I congratulate you upon your state association; I admonish each and every member to attend all the meetings, not alone for the technical and practical knowledge gained, which is always very profitable, for no two or three professional men can get together and discuss a subject but that each will be the wiser; also, by meeting together, each will become acquainted with the various situations in every part of the state, discuss the requirements necessary to the good of the profession, and for the formulating of regulations to be enacted into laws.

Gentlemen, I thank you for your invitation and for the pleasure of meeting with you. I trust that my remarks may be taken in the spirit that they are given, for my desire is that the community in which we practice and the profession at large will be the better for our having been veterinarians.

Dr. D. F. Luckey, State Veterinarian of Missouri, relinquished that position on January 15 to engage in private practice and farming in Stoddard County, that state. We surely wish that the doctor's efforts in his new field of activity may be attended with the success that he so thoroughly deserves.

Our American Horse Industry.—Our 6,000,000 farms have 25,000,000 horses and mules and 6,000,000 horses in our cities, towns and villages gives a grand total of 31,000,000 horses, greatest of any nation, at government valuation of $110, is $3,500,000,000. * * *—*Live Stock Journal.*

MAMMITIS.*

By R. Milton Weightman, Oswego, N. Y.

In selecting my subject I thought I would choose one that had given me a great deal of trouble.

Some diseases which used to cause us great anxiety and worry have been made comparatively easy to treat by the scientific discoveries of the past few years, viz.: milk fever, with the oxygen treatment; colics and impactions with the hypodermic tablet treatment, and the many serums and antitoxins that we can keep on hand for immediate use, so convenient and easy to carry and apply.

But this common disease of mammitis, which we meet so often in practice, has always been very troublesome for me to treat successfully, and I have brought it forward in the hope of getting "more light" on the subject.

If we have a client with a thousand-dollar cow, and she loses a quarter from mammitis and the chance of ever making a record, we don't stand very high in his estimation.

Sometimes we have a case develop over night, without any apparent cause, when a good clean-out, with careful diet and thorough or almost constant milking, the case will respond to treatment very quickly and soon be well; but usually the cases are well advanced when we are called, some advertised cure having been used by the owner. Some cases are much longer developing, beginning with a scab on the end of the teat, the inflammation traveling up the milk duct into the udder and finally developing mammitis. This form seems infectious, and I believe many cases are caused from bacterial infection, by the teat coming in contact with the bacteria on the floor, while the

* Presented to the Central New York Veterinary Medical Association, November 28, 1911.

cow is in the recumbent position; the floor being soiled by the bad habit of milking these cases on the floor and not cleaning it away, or from a retained placenta or anything of a bacterial nature. Other causes, such as cold drafts, sudden changes from hot to cold, wet weather, kicks, blows, barbed-wire cuts, a teat stepped on and cut or crushed, poor milking, improper feeding, hefting or stocking for sale, and many others which you all know.

But no matter what the cause, I always find mammitis a difficult disease to cure and bring the patient back to her normal flow of milk.

A good deal of the care has to be given by the owner or hired help, and in protracted cases they are apt to get discouraged and the case, very much neglected, ends badly.

The treatment is to remove the cause, if possible.

Internally, clean out with epsom salts, either one large dose or small doses in conjunction with nitrate of potash, or eserine and pilocarpine can be used; if the fever is high, a few doses of aconite, and stimulants during a chill if seen during that stage.

Externally, blanket, keep body warm, clay dressing and cotton, camphorated oil, phytolacca or belladonna ointment, iodoform and oil injections, sodium or hydrogen peroxide irrigations, iodine. If the udder is very swollen and heavy, a suspensory bandage should be applied with proper holes for the teats, so that milking can be continued without disturbing the dressing, as it is most important in all cases to milk out often and keep the bag empty, using the tube if milking by hand causes pain; if the udder has got indurated, so hard that you cannot make any impression, mercurial ointment, camphor and linseed or olive oil mixed and applied two or three times a day.

The old-time method of putting a hungry calf to a cow suffering from mammitis is atrocious and cruel.

If the teat cannot be kept open and the contents of the bag milked out, abscess formation must take place; then the case must go to the knife, and when pus is once detected the sooner it is let out the better. If gangrene develops, which is not at all

unusual, and may develop in a very short time, and usually in the teat, promptly remove all parts affected, apply chloride of zinc solution until the destruction is controlled, then heal up by packing with white lotion and cotton or healing powders.

THE MINNESOTA VETERINARY MEDICAL ASSOCIATION at its fifteenth annual meeting in St. Paul, January 10, 11 and 12, enacted the entire program as published in the January number of the REVIEW and, in addition, had a very successful clinic at Dr. Chas. E. Cotton's most excellently equipped hospital in Minneapolis on the last day. One of the especially interesting and satisfactory features of this meeting was the presentation of "Stallion Board Work," by Mr. Montgomery, assistant secretary of the Minnesota Stallion Registration Board, with a horse for clinical demonstration, at the university farm, examinations and discussions being taken part in by a large number of the veterinarians present. This was especially *a propos,* as great effort is being made in Minnesota to secure the most cordial and helpful co-operation between the veterinarians of the state and the Stallion Registration Board management. Stallions are not allowed to stand for public service in that state until a qualified veterinarian has examined them and attested to their freedom from infectious disease and transmissible unsoundness. Another thing that added very materially to the enjoyment and edification of the members was the fact that the Minnesota State Live Stock Breeders' Association was in session at the same time. Several veterinarians attended the breeders' association banquet, a very good example for veterinarians in general to follow. Dr. J. N. Gould, of Worthington, Minn., spoke for the veterinary profession in the after-dinner program. According to a provision by law, which the Minnesota Veterinary Association has created, it had three voting delegates as usual to the State Agricultural Society (State Fair), President Mack, and Drs. McGillivray and Amos. This evidence of progression and expansion in importance of the Minnesota association in relation to the live stock industry of its state impresses us and makes us wonder if in any other states the state veterinary associations have a voice in the management of their State Fairs. We wish that *all* might have.

REPORTS OF CASES.

MY OBSERVATIONS ON OVARIECTOMY OF THE MARE.*

By H. Fulstow, Norwalk, Ohio.

Ovariectomy, or castration of the mare, is an operation that is chiefly performed for the relief of nymphomania.

Mares that are affected with this troublesome affliction are a source of great annoyance to their owners and, in fact, to anyone who has the care and management of them. They are irritable and ticklish, and if anything happens to touch them they kick, switch and urinate. If they are hitched they get straddle the pole or over the cross-bar, or get tangled in the harness, and sometimes run away and do a great deal of damage.

Others will be just the opposite; they will kick all of the time when not in heat, but when they are in heat will be gentle and tractible.

Again, others will not kick at all but will switch and urinate, especially when another horse happens around or you touch them with anything.

This operation is not a new one by any means, but it is the *modus operandi* which is now practiced that relieves it of the great dangers that accompanied it when the flank operation was in vogue. As far as I know, no one ever attempts the flank operation on a mare, although it is performed successfully upon cows.

Prof. Williams, of Ithaca, N. Y., was the first one, I think, in this country to perform this operation to any extent, per vagina, and in 1900, while at Detroit, I heard Prof. Williams describe his *modus operandi*, which seems to be a very safe way of operating.

Out of 87 mares that I have operated upon per vagina, I have had only one fatality, and that was from hæmorrhage, and one of them was in foal at the time at the time of operating, and I

* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

did not know it until I had cut into her. Of course, I must admit it was carelessness on my part in not finding out that the mare had been bred, and furthermore, had I examined her before I commenced to operate, I would have known that she was pregnant and would not have attempted to operate upon her at that time. But fortunately, no complications arose; she never missed a meal, as some of them have done that were not in this condition. She went on and had a live foal about four months afterward.

While I have had only one fatality, I have had three or four that developed abscesses and one or two that got constipated and showed colicky pains. But by close observation and treating the different complications as they arose, they went on and made good recoveries.

When I first began to operate, I took any mare that came along, regardless of the history, but I had not operated upon very many before I found that the results to be obtained were a complete failure in some cases, while in others they were all that could be desired.

I think I can safely say that 95 per cent. of all the cases I have operated upon had one or more ovaries that were cystic.

There is no doubt in my mind but that all of you have run across some cases of this kind, and when you do, just what to advise your client as to the results to be obtained by operating is the question to be decided.

Now, I have arranged or divided them into three classes:

1. Mares that are mean when in heat only and those that are continuously in heat but do not kick, will be cured by ovariectomy.

2. Some mares that kick nearly all the time, whether in heat or not, will be cured by the operation. Some others will be benefited, and in some few cases it will do no good.

3. Old mares that have kicked for years and have contracted the habit, and those that kick all of the time when not in heat, but when in heat are gentle, the operation will not benefit at all.

MODUS OPERANDI.

All the instruments needed are a Colin's scalpel and a spaying ecraseur.

The first and most essential thing is to examine the patient and make sure that she is not suffering from any contagious or

infectious disease, and that she is otherwise healthy. Also inquire whether she has been bred or not.

Then, if the animal has been kept up on dry feed, it is a good plan to give a laxative to clean out the intestinal tract and feed her on bran mashes with a little hyposulphite of soda in it.

The tail, vulva, and all external posterior parts should be well cleansed with warm water and soap and then a 1-1000 bichloride of mercury solution. Place a sterile bandage on the tail.

Just before the operation give a rectal enema to remove all fecal material, and then the clitoris and lips of the vulva are cleansed of all sebaceous material and dirt by using a 50 per cent. alcohol solution. This must be immediately removed by a ½ per cent. soda bicarb. solution, to prevent irritation of the mucous membrane of the vagina and straining on the part of the mare.

Once more the posterior parts are cleansed and given a 1-1000 bichloride bath, and a clean, sterile bandage applied to tail. Now she is ready for the operation, which may be performed with or without anæsthesia, the one without seeming more popular, more practical and somewhat safer.

When ready, place the animal in stocks, if you have them; if not, you may use a sling or hippo-lasso, which does very well. But I prefer stocks.

By means of ropes, surcingles and hopples, secure her so she can neither lie down, rear up, strike, kick, or swing her head from side to side, and have an assistant to elevate the tail.

The instruments, which have been previously sterilized by boiling in soda bicarb. solution, are handy.

You must have a reliable assistant to hand you the instruments and to work the ecraseur.

The operator's hands and arms must be as nearly sterile as possible, as the success or failure of the operation depends greatly upon the antiseptic precautions taken.

The vagina is ballooned, that is, made to dilate and draw its walls tense, by introducing a warm, aqueous solution of soda bicarb., then going in quickly with the Colin's scalpel in the right hand and just to the right or left of the median line, and above the os uteri; make a forward thrust with the unsheathed blade of the knife. Don't cut upward, or downward, or any further in than is just necessary to puncture the wall of the vagina and the peritoneum covering it at this point. Then withdraw the hand, wash the hand and arm in a sterile water or a solution of

soda bicarb., and then, by introducing first one, then two, and then three fingers, dilate the wound so the whole hand may be passed through the incision. Then follow the uterus to its bifurcation, and then each of the horns to the ovary on the far extremity.

After locating each of the ovaries in this manner, draw out the hand, tighten the chain of the ecraseur so it will just slip over the ovary easily, and going in again slip the loop over the organ, tighten the chain slightly so the ovary will not slip out, and then make sure there is no loop of intestine in the ecraseur. The chain should be well down on the ligament and fallopian tube. The assistant takes off the ovary by the ratchet-like movement of the instrument. This should be done slowly, and the operator keeps the ovary in his hand till it is severed and out of the body. Then clean everything and take off the other ovary in the same manner. It is more convenient to use the right hand for the left ovary, and vice-versa.

After both ovaries have been removed, the vulva and external parts are cleansed of all blood, if there is any, and the posterior parts sponged off with a clean 1-1000 bichloride solution; and the mare is taken out of the stocks, blanketed according to the weather, walked for about two blocks, and then placed in a good, roomy box stall with plenty of good, clean bedding, and she must have very good attention; given only laxative food and not too much of it. And continue to give one ounce of artificial Carlsbad salts three times a day in water or mash.

If colicky pains develop, it is due to infection at the seat of incision and a small abscess there, or to constipation and the full rectum pressing on the wounded vagina.

If there is an abscess, it may be opened from the vagina, by the fingers or the scalpel. And if there is fever, give large doses of quinine. If it is due to constipation, give frequent enemas to remedy this.

After six or seven days of close observation, if no complications arise, and she is feeling good, send her home and she may be put to work as soon as she is in shape. But the owner must be careful till she has had time to forget her old habit.

The most important things to be remembered are to be sure that the mare is in good health before the operation; not to use strong, irritating antiseptics in the vagina; not to puncture the vagina till it is ballooned, and if it collapses before you puncture

the first time, balloon it again, and be sure to keep the bowels open, and to watch for colicky pains, or a rise in temperature.

The flank operation is not as practical for the mare because it is apt to lead to a septic peritonitis, and, besides, the ovaries are not as easily reached from that opening as from the other.

You will find this operation, as above described, a comparatively safe and easy one, and a means of making a good mare out of a practically useless one.

CASE REPORTS.

Class No. 1, *Case No.* 1.—Black mare, seven years old, draft breed. History: Kind and gentle when not in heat, but when in heat kicks and urinates, gets straddle the wagon pole, becomes unmanageable, and runs away. She was becoming worse every time she was hitched. I advised ovariectomy and performed it. The operation was successfully performed and no complications arose. The mare was kept quiet for ten days and fed a light diet, after which time she was put to light work, and after two years' observation I can say she was cured.

Case No. 2.—Gray mare, seven years old, roadster, pacer, with quite a burst of speed. History: Kind and gentle till in the summer of her fourth year, when one day as she was in heat and being worked out, she kicked herself free from the cart, and every time she came in rut after that she would kick. But she was gentle between times. I advised breeding, which was done, and the mare got in foal and was gentle all the time she carried it. But after foaling she was worse than ever; although she was bred several times, she failed to get in foal again. My advice was sought, and I advised spaying, but the parties thought it was too risky, so traded her off to an implement dealer, and then I traded for her for the express purpose of performing ovariectomy. Ovariectomy was performed; no complications arose until the tenth day, when she came down with influenza in a mild form. After getting well from the influenza, I hitched the mare without kicking strap, and drove her about every day for eighteen months to a buggy. About six months after the operation, while out making a call, she was stepping along in good shape when she suddenly became frightened at an object by the roadside and stopped; the outside belly-band broke and let the cross-bar onto her behind. You may be sure I was looking for some trouble, but she never wiggled her tail. I got out, made a belly-band out of my tie-strap, and went on as if nothing had happened.

Case No. 3.—Sorrel mare six years old, roadster. History: This mare appeared to be in heat all the time; she would switch, strain and grunt when another horse came around, or you happened to stop her in the road to talk to anyone. But she did not kick. Ovariectomy was performed and she recovered without complications. This mare was completely cured.

Class No. 2, *Case No.* 1.—Bay mare, roadster, eight years old. History: She would switch, kick and urinate all the time, whether in heat or not. Ovariectomy was performed; no complication arose; she only kicked once, about four weeks after the operation, and then did no damage, but she kept squealing for six months or more and finally stopped that. Now, after about eighteen months, she is a good, serviceable mare and is apparently kind and gentle, so that the owner's wife drives her everywhere.

Case No. 2.—Bay mare, seven years old, general purpose. History: Kicks, whether in heat or not, in the barn, and it is quite a "chore" to harness her. Also kicks when hitched, especially if a line or anything happens to touch her. Ovariectomy was performed, and the mare did well till five days after the operation, when she refused food, looked around at her side, appeared dull, had an elevated temperature, and her bowels were constipated. An examination revealed an abscess at the point of incision, which was evacuated with the finger. The constipation was relieved by rectal enemas and artificial Carlsbad salts. She also had a few doses of echinacea for the septic condition. In about a week she was sent home entirely well. She has not kicked since, now over a year.

Case No. 3.—Bay mare, five years old; grade, German coach, used by a liveryman. History: She was in heat all of the time; she would kick, switch and urinate, and was practically useless. Ovariectomy was performed and she recovered nicely from the operation, and was put to work, but occasionally she would kick. However, she was much better than before the operation.

Class No. 3, *Case No.* 1.—Gray mare, draft breed, aged. History: She would kick when in the barn and when at work. Ovariectomy was performed, and she got along nicely from the operation, but the owner said she was worse, if anything, than she was before the operation.

Case No. 2.—Bay mare, twelve years old, draft breed. History: She kicks all the time when not in heat, but when in heat she could not be made to kick. Ovariectomy was performed; no complications arose, the mare was taken home; but I can't say she was one bit better than she was before the operation.

Case No. 3.—Bay mare, cob, aged, well-bred roadster. History: She was switch, kick and urinate, and run away. I advised him to trade her off, as, in my opinion, the operation would do her no good. But he had seen one or two that had been operated upon and made good mares, and he wanted to take the chance. So I operated upon her. The operation was successful, but the patient still kicks and runs away.

In writing this paper I have given you my personal observations, so you can draw your own conclusions as to the results to be obtained.

RUMENOTOMY WITH A PERMANENT OPENING FOR THE RELIEF OF CHRONIC HOVEN.

By E. A. Weston, G.M.V.C., B.V.Sc., Perth, Western Australia.

The subject of this operation was a valuable Ayreshire bull imported into Tasmania by a prominent breeder. Shortly after his arrival he was exhibited at one of the leading shows, where he took first prize in the two-year-old class. Unfortunately he had a bad attack of tympanitis of the rumen, and his owner punctured him with a trocar and canula. From this out these attacks recurred with increasing frequency, and the bull was punctured on several occasions by his owner. My advice was now sought, and I immediately prohibited the use of the trocar and canula and substituted the probang; meanwhile putting the bull on a long course of nux vomica, bicarbonate of soda and ginger. For a time he improved, but the tympanitis recurred and at length became so bad that the probang had to be passed twice daily. During this time the bull had wasted to a skeleton, and his owner gave him away to a neighbor, Mr. Barnard, President of the Dairymen's Association—merely stipulating that he should have the use of him (the bull) should he recover. Mr. Barnard again consulted me and suggested that the bull's life might be prolonged if a permanent opening into the rumen could be made. This I agreed to do, and having chloroformed the patient, I cut down on the rumen, which proved to be partly adherent to the peritoneum. After making an opening into the rumen, somewhat smaller than that through the skin and muscles, I stitched the edges carefully together. That night, when sitting in the dining room, we could hear an extraordinary sound pro-

ceeding from the stable, which proved to be the bull grinding his teeth. He would fix himself into position and go through the performance of throwing a cud, but the hole in the rumen seemed to prevent him from fixing the diaphragm and carrying out the process of forcing the wad of food into the œsophageal opening, and no cud passed up the œsophagus. He, however, seemed to think it ought to be there, and worked his jaws with great vigor, hence the sounds we had heard. Some days afterwards I received a note from Mr. Barnard saying that the bull was doing splendidly, and that "when he was not eating he was chewing his cud, and when he was not chewing his cud he was eating." Shortly after this I left Tasmania to take up a position in the Stock Department of Western Australia, and I heard no more of my patient for seven months, when I wrote to Mr. Barnard to know how he was getting on. The following is his reply:

"The bull is doing well, and during the summer grew a great deal. He is in capital order and this new outlet does not seem to bother him at all. Once it got blocked with a wad of grass and my efforts to remove it were disastrous to my clothes. He blew up at once, showing pretty clearly that without the hole he would be as bad as ever. It has healed up to about one inch in diameter. If it could have been about an inch and a half higher it would be better, as he would not overflow quite so much."

OESOPHAGEAL PULMONARY FISTULA IN A PIG.

By E. A. Weston, G.M.V.C., B.V.Sc., Perth, Western Australia.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

While inspecting some piggeries yesterday, I came across a case which is a novel one so far as my experience goes, and may prove of interest to some of your readers.

The subject was a white sow, who, her owner stated, had been ill for three weeks. He informed me that he had carefully studied the case, and consulted "Long's Book of the Pig," with the result that he had diagnosed the trouble as "gastritis." The

animal had a temperature of 105.5° F. and showed evidence of long-continued fever in her wasted appearance and dry, scaly skin. She had evident trouble in respiration, her breathing being short and rapid, while handling her produced a husky, rasping and continuous fit of coughing; reminding one of verminous bronchitis. However, when I came to use the stethoscope, I was at a loss to know what to make of the case. Some sounds suggestive of pleurisy could be heard on the left side, and nothing on the right. I advised the owner to slaughter the animal as there was some serious lung trouble, the nature of which I was unable to determine. This he consented to do, and post mortem revealed a curious state of affairs. The pig had swallowed a sharp piece of tin, pointed at both ends and closely resembling a small lanceolate left. This had traveled down the œsophagus till it reached about the middle of the thoracic cavity, when it had cut clean through the walls. Instead of the food escaping into the thoracic cavity, as one would have imagined, a sinus had formed leading into the lung. The pulmonary pleura had become detached from the lung, thickened, and firmly adherent to the thoracic walls, forming a cavity capable of holding a small cupful of food. Into this, portions of ingesta had continued to pass, and it was filled with debris containing split peas, wheat, oats, etc., while an abscess had formed in the diaphragm. This extemporary pulmonary stomach (if I may so term it) interposed between the lung parenchyma, and the thoracic wall was what had effectually prevented my hearing any sounds on that side. The abdominal organs showed no evidence of disease. One can only wonder how the pig lived so long, and she should take her place on the immortal scroll of fame with that legion of tough old cows who have at various times managed to live for weeks and weeks with hatpins, wire nails, pocket knives, umbrella ribs, barbed wire, plain wire and various other choice morsels penetrating their internal anatomy.

MULTIPLE INTUSSUSCEPTION IN A CALF.

By A. J. Damman, D.V.S., M.D.V., Ellensburg, Wash.

I was called to see a calf owned by a farmer living seven and one-half miles out of town, October 6, 1911. The owner said that he had lost one the day before which appeared just the same

as this one. He urged me to hurry, or it would be dead before I would get there; and so it was. The post mortem was made by Dr. C. P. Clark and myself and revealed the knotted intestines as shown by the cuts, which were of all lengths, ranging from

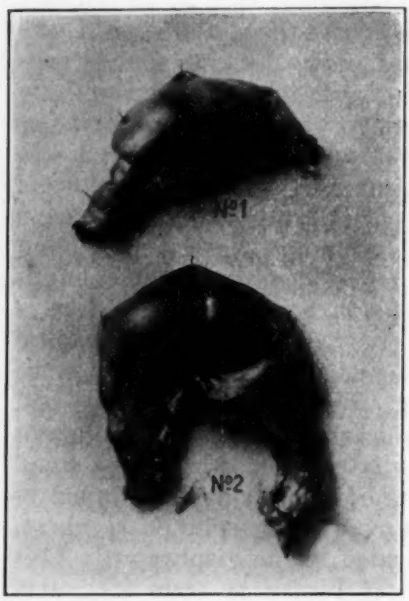

PLATE No. 1.

PLATE No. 2.

one inch to six inches of a telescope; there were 16 of these knots. The owner said that the calf was in great pain, would bawl as if it was being horned, and stamp its feet just like a horse with the colic. Plate No. 1, Cut No. 1, will give you an idea how the smallest appear, and Cut No. 2 in Plate No. 1 shows the larger ones; Cut No. 1, Plate No. 2, shows how the intestine was telescoped. The light part of the intestine was doubled back into the dark part of Cut No. 1, Plate No. 2. The calves had been running on pasture containing clover, alfalfa and timothy; also fed skim milk once a day. The grass had been frozen quite hard for a night or two before the calves took sick. There were ten or a dozen others which showed no bad effects. I questioned the owner as to whether the calf could have been kicked by a horse, fallen from a high bank, or squeezed through a small opening; all of which he answered in the negative. Will say

that all organs were normal and there was no gas in any of the telescoped parts.

What was the cause of the knotting? A free expression of opinion by REVIEW readers is requested.

LEAD POISONING—A LEGAL DECISION.

In the suburbs of the city, where the Duke of Connaught, Governor General of Canada, resides, a large area of land is being subdivided into lots and sold for building purposes. Approaching this area a large field sign was erected in a field at the instance of a real estate company and painted by a sign painting company. A landscape was designed and painted in striking colors with the name of the real estate company in conspicuous letters at one side. The property is part of the estate of Mr. Keefer, a white-haired old gentleman who installed the now extinct horse cars in Canada's capital many years ago, and was leased to a Mr. George Farmer for pasture purposes. The real estate company contracted with the sign company to erect it, but did not obtain the permission of the owner or lessee of the land. A few days after erected, two of Mr. Farmer's cows died, and a post mortem by Veterinary Surgeon Harris, of Ottawa, revealed that they had died from lead poisoning, such as found in paint. The veterinary surgeon inquired if there was any paint around the premises that the cattle might have eaten, and on examination quite a quantity of red, green, black and white paint was found within a radius of twenty feet of the sign. He at once attributed the cause of death to the cows eating the paint, a portion of which had evidently been thrown out of the cans when the painters had finished their work; for it was found in a copious batch several feet from underneath the sign. A quantity of the grass saturated with the paint was produced as an exhibit in the court. On the evidence the court held that the plaintiff had good ground for action and was entitled to damages, but just as to the relative responsibility of each of the defendants his Lordship had to do some deep thinking. The real estate men, it was pointed out, were primarily responsible for ordering the sign men to go there without having first obtained permission, but on the other hand the real estate men did not want to be blamed for what they regarded as negligence on the part of the painters in

throwing the paint around so that the cows could eat it. The sign men held that they were simply acting on the instructions, that the real estate company knew that there was an element of danger in the work and had no business to send them there to do the work without first notifying the plaintiff so as to give them an opportunity of taking precautions against the cows eating any grass from around the sign, as some naturally would fall from the brush in the process of the work. After a lengthy legal argument the court condemned each defendant to pay one-half of the amount paid for the loss of the cows.

AN INTERESTING HOG.

By E. JACKSON, South Omaha, Nebraska.

This is a picture of the much-talked-of mule-footed hog, taken by Dr. Andrew English, of the South Omaha B. A. I. force. The hog is hanging by the gambrels, head downwards.

Another peculiarity shown by this picture is the growth of the wattles* on the jowls. These are a fatty growth with a small arrow of cartilage, and a few muscular fibres running parallel with the cartilage, extending the entire length through the centre of the growth.

These wattles are not false teats, as supposed by some, this being the picture of a barrow hog. Neither are they the result of branding, as there is no scar tissue present. It has been contended that these growths were brands similar to the dewlap brand often seen on cattle.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

MESENTERIC TUMOR CAUSES INTESTINAL STRANGULATION [*William S. Mulvey*].—Black hunter gelding has had a fairly stiff day's cub hunting, and is apparently not the worse for it. He seemed well up to late in the afternoon, when he had a sharp attack of colic. Draught is given followed by dose of physic. Later in the evening he is rather worse, his attacks are sharp, and at varied intervals sedatives and enemas are prescribed. The next morning he is dead. The post mortem showed a tumor of fatty nature suspended from the mesentery by a peduncle some eight inches long and attached some six inches below the right kidney to the muscular wall of the abdomen, having a small foramen through which a loop of intestine had passed and become strangulated.—(*Vet. Record.*)

ANEURISM OF THE POSTERIOR AORTA [*Henry B. Eve, M.R.C.V.S.*].—A thoroughbred brood mare, in foal, aged, 16 hands high, is taken to her stable, ate her feed and within a quarter of an hour is found dead in her stall. The post mortem revealed the cause of death to be due to a rupture of the posterior aorta, whose walls were found in an atheromatous condition. The animal had not been tied up, was not cast and died without a struggle.—(*Ibid.*)

SERIES OF CLINICAL HORSES [*Prof. J. J. O'Connor, M.R.C.V.S., of the Dublin Royal Veterinary College*].—*Castration of a double rig.* Operation described as follows: Incision of a transverse fold of the skin over the near external inguinal ring; exposure of a large plexus of distended veins equal to a man's thumb; exploration of the inguinal canal where the epididymis was found enveloped with fibrous sheath which was open; traction upon it to draw the testicle; failure in doing so, the hand

was passed to the uppermost and outermost part of the canal, the anterior wall was punctured, and with the two first fingers inserted into the opening the testicle was found soft and flabby and removed with the ecraseur. Same steps were followed for the second testicle.

Thrombosis of the Iliac Arteries.—Case of a seven-year-old mare which presented the ordinary symptoms of this lameness and at the post mortem of which was found a large, pale clot distending the posterior aorta at its division with the iliacs, all of which, except the right, were apparently completely occluded. There was also a large aneurism with calcareous walls in the posterior mesenteric artery. The mother of the mare suffered of a similar affection.

Rupture of the Colon in a Horse.—Old bay gelding manifested colics and died. At post mortem the abdominal cavity contained large quantity of food and sand. There was a large rupture of the first part of the double colon. There was also one of the stomach.

Sinus in the Axilla of a Polo Pony.—Record of the case of a pony which got staked jumping a fence, and was seen by the writer eighteen months after. Lameness and discharging fistula on the near axilla. Animal was cast, opening of the fistula enlarged and the broken-off top of a cut hawthorn bush was extracted. Complete recovery followed.

Abnormal Quantity of Fat in Temporal Fossa of a Horse.—Trotting horse had doughy swelling in the near temporal fossa. The eyeball has cataract and protrudes considerably. An incision was made over the centre of the swelling, which was found composed entirely of fat. It was removed. Also was the useless eyeball. The animal was then cured of a shying disposition which rendered him difficult to handle previous to the operation. —(*Vet. Journal.*)

INTUSSUSCEPTION [*Lieut. H. C. Stewart, A.V.C.*].—Aged bay mare is suddenly taken with spasmodic colic. She has severe acute spasms, no distension of the bowel, normal temperature, no peristalsis audible, but borboryms. She endeavors to roll on her back. Rectal examination revealed presence of a cord-like, painful swelling. Rectum quite empty. Notwithstanding careful treatment the animal dies. Post mortem revealed ruptured stomach. Floating colon shrunken and empty. A dung-ball as big as a man's head and containing gravel, nails and screws were

found in the fourth portion of the double colon. Two small dung-balls were found towards the pelvic curvature. The small intestines contained blood and an intussusception found measuring about six feet. There was strangulation of the invaginated portion. After reduction and evacuation of the contents the invaginated portion measured 7½ feet and the invaginating 20; making a total of 27½ feet of intestines involved in the diseased process.—(*Vet. Rec.*)

Lympho-Sarcoma in the Dog [*E. Wallis Hoare, F.R.C.V.S.*].—This Irish water spaniel dog had distemper, and on recovering from it had a peculiar appearance of the eye and a number of enlargements on the skin in various parts of the body. He had acute conjunctivitis, and these hard, flattened swellings are observed over him. He shows distress when exercised. After a few days some of the tumors of the skin ulcerated, the lymphatic glands became enlarged. The dog was destroyed. Autopsy: Small amount of fluid in the pericardial sac. Liver enlarged and congested. Abdominal lymphatic glands enlarged. Examination of these glands and cutaneous tumors revealed them to be round-celled sarcoma.—(*Vet. Rec.*)

Chronic Bursitis in a Dog [*Prof. J. J. O'Connor, M.R.C.V.S.*].—Irish wolfhound had a swelling on the left ischial tuberosity with callous ulcer, the opening of a cavity lined with hard granulations. With cocaine injected, the dog was operated. The opening enlarged, the lining of the cavity dissected and the cavity dressed with tincture of iodine and later with antiseptic powder, nitrate of silver, etc. Biniodide of mercury was applied to stimulate the absorption of the cicatricial tissue.—(*Vet. Journal.*)

Fistula on the Radius of a Setter [*By the same*].—Dog got bitten by another on the right foreleg. After three months the wound is not yet healed. There is swelling hot and painful, and two fistulas, one on each side. Anæsthetized with the chloroform, the fistulas were incised and curetted, a cavity made in the bone, leaving the fistulas communicating. Dressing of iodoform and boric acid was used. After a fortnight small pieces of loose bone came away and the dog rapidly recovered.—(*Ibid.*)

Cavalry Collisions in War [*Lieut. E. Lishman, A.V.C.*].—This is the interesting record of three post mortems due to

such accidents of collisions in horses galloping into each other, as would be the case in war in cavalry charging cavalry. Two of the horses had accidentally been galloped into each other head to head, and just before the impact took place one had raised its head, so that the full force of the collision was between the horse's mouth and the other's cranium. Both dropped instantly as if they had been shot. One had its brain penetrated by the upper incisor of the other, three of which were found broken off in the brain substance. The other head showed that the three upper incisors were broken and also considerable hæmorrhage at the base of the skull. No fracture could be detected after boiling. The vertebrae were also normal.

The third horse had been galloped into by another while standing still, had been knocked down, manifested colic and died two hours after. The autopsy showed a rupture of the stomach with the contents scattered in the peritoneal cavity.—(*Vet. Rec.*)

Abdominal Wound with Intestinal Protrusion in a Cat [*E. Wallis Hoare, F.R.C.V.S.*].—Cat fell through a greenhouse roof and sustained two wounds, one in the abdominal region, in front of the umbilicus, and the other on the left flank. This last did not extend through the abdominal muscles, but the first did. It easily admitted three fingers, had a jagged character, and through it protruded a large amount of intestine. This and the omentum were soiled. Chloroform was administered, torn tissues removed, intestines cleaned with *Lig. cresolis* and peroxide of hydrogen, and returned in the abdomen. The wound was closed with Japanese silk and bandage applied over. The cat tore it up a few days after, but the sutures remained intact. The second wound suppurated some. The cat did well except that he had a little constipation, which was relieved with calomel.—(*Vet. Record.*)

FRENCH REVIEW.

By Prof. A. Liautard, M.D., V.M.

Two Cases of Superficial Rupture of the Spleen—Death in Two and Three Days [*M. Bonnigal*].—Two observations similar in cause and lesion, which differ only in the fact that in one the lesion occurred in the internal and in the other on the external face of the spleen.

In one the animal was placed next to another without separation; he was found one morning with marks of kicks on the legs, but none on the body. For two days he was out of sorts and refused all food. In the morning of the third day he was found dead in his stall. The post mortem shows the tissues pale and bloodless. The peritoneal cavity was full of blood, and on the internal face of the spleen there was a linear laceration measuring 20 centimetres in length.

The second horse was also in a stable alongside another without separation. Kicks were exchanged. This horse was put to work, performed it well, but ate poorly. In the middle of the night he becomes very restless, drops and dies. Post mortem reveals similar conditions as in the first case, but the rupture of the spleen is on the external face of the organ and runs in a transversal direction.—(*Presse Veterin.*)

Ischemic Gangrene of the Intestine in a Horse [*Mr. Puel, 4th year student*].—This animal had a fall while in harness; he slipped with his left foreleg carried in extreme abduction. He rises and is taken to his stall. The second day after he has violent colics which, treated, are somewhat relieved, but yet not entirely, as for two days longer he has slight pains and cold sweats. The fifth day after his fall he dies. Autopsy: Removing the left foreleg, abundant collection of dark blood is found under the pectoral and olecranon muscles. Opening the abdomen, the intestine is exposed with slightly red color and is distended with gases. The mesenteric artery is thick and hard. A short distance from the cæcum there is a mass of intestine 45 centimeters long, white, anæmic, and bound at its extremities by a hæmorrhagic ring. On a level with this gangrenous portion the serous coat is adherent to the omentum. There is no other lesion of the intestine, nor on the parietal peritoneum or omentum. Cutting the intestine open, all the characters of this ischemic gangrene are found and the separating fixture of the dead organ is well marked. There were also lesions in the stomach, liver, pleura, pericardium and myocardium, manifestations of the toxemia cause of death, resulting from the auto-intoxication produced by the gangrene.—(*Revue Veterin.*)

Treatment of Paraxystic Hæmoglobinemia by Subcutaneous Injections of Air [*Mr. Brunschwig*].—Presuming of the similarity which is claimed by some as existing between

this disease and parturient apoplexy, the author has attempted a form of treatment which has proved in his hands successful in four bad cases. The animals seriously affected and unable to rise and stand up, were relieved in a few hours and recovered very rapidly. The treatment consisted in injecting under the skin of the neck, chest and shoulder a sufficient quantity of air so as to obtain a certain amount of insufflation to distend the skin as far as resonance with percussion. The air is pushed first over an antiseptic fluid and filtrated with wadding. The antiseptic fluid is made of spirits of turpentine, 4 parts; spirit of thymus, 2 parts; creosote, iodoformed ether, thymol, camphor, of each, 2 parts. The skin being open and the insufflation made, say, with a bicycle pump, the gaseous tumor is seen spreading. No reaction follows and the operation seems painless. The author has treated several cases of hæmoglobinemia by this method and obtained excellent results.—(*Journ. de Zootechnic.*)

VAGINAL BANDS IN BREEDING COWS [*Mr. E. Chapellier*].—These are not infrequently observed and, on account of their situation, are considered as the remains of the hymen membrane. Generally they do not interfere with parturition, but sometimes they do. In this present case the band represented a true fleshy column, occupying the middle of the vagina and preventing the expulsion of the placenta. A cow had delivered without difficulty a living calf, and was making unsuccessful efforts to throw off the placenta. It is hanging from the vulva and is kept held in the vagina. In one of the expulsive efforts of the cow, this organ prolapsed and thus, in its middle, was observed a long, reddish cord, round, in which the placenta was held by a loop. The knot was undone, the placenta removed and the cow relieved of her pains. Two weeks later, the vaginal band being relaxed to its normal size was found quite thick and flattened. It was attached to the mucus on the floor back of the urinary miatus and above on the roof of the vagina. It was removed with the ecraseur, cutting it at both ends.—(*Rec. de Med. Vet.*)

ITALIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

THE WHITE SPOTTED CALVES KIDNEYS [*Dr. P. A. Pesce*].—The author passes a review of the various works and theories that have been advanced on the subject. Those of Vaerts, Guille-

beau, Ostertag, Kitt, Rieck and others are concisely examined, and finally Pesce arrives at the following conclusions:

1. White-spotted kidneys of calves are undoubtedly of inflammatory nature. They consist in a parenchymatous and interstitial nephritis, with, however, a proliferation of the connective tissue, particularly during the later development of the disease.

2. The lesions do not disappear entirely with age, remain in adult life, undergoing changes which alter their aspect.

3. The theories of Vaert and Guillebeau are without foundation.

4. The primary cause of the disease can be attributed only to the action of micro-organisms, although no germ can longer be detected during the stage where those lesions are developed.

5. According to all probabilities, the lesions ought to be considered as an advanced stage of purulent nephritis and as a period of that disease.

6. To the point of view of alimentary hygiene, the importance of the disease remains limited to the kidneys, and these organs alone ought to be kept away from general consumption, and although no accident might follow their use, it would be a prudent measure to have them seized by the meat inspector.—(*Clinica Veter.*)

A Case of Diabetes in a Steer [*Dr. P. Bimbi*].—Five-year-old steer is dull since some time and works with difficulty, getting tired easily. He has lost considerable flesh and moves with difficulty. The skin is dry and the coat staring. Temperature and pulse are normal. The animal drinks well and takes large quantities of liquid. He also urinates frequently and abundantly. Examination with the ophthalmoscope reveals slight opacity of the crystalline lenses, and when the animal is left alone when he walks he knocks himself against surrounding objects. Suspecting diabetes, the urine was examined and quite a large quantity of sugar was detected. Some days after the steer died in a comatous condition. At the autopsy there was found great atrophy of the pancreas, which was reduced to the condition of a small, fibrous mass.—(*Il. Mod. Zooia.*)

Pilocarpine and Eserine in Orstruction of the Third Stomach and Tympanitis of Cattle [*Dr. Giovanni Floris*].—This is the record of four cases among a number of other similar ones where the author resorted to the subcutaneous injection of

a solution of muriate of pilocarpine and sulphate of eserine. The condition of the animals was about the same in all; dull appearance, obstinate constipation, marked tympanitis, negative rectal exploration, normal temperature, etc. The constipation had been treated by rectal injection and soap-water drenches. The subcutaneous injection was followed with its ordinary effects and satisfactory results of abundant defecation shortly after its administration. The general condition of the animals was improved shortly after. The author insists upon the great benefit he had obtained and recommends the same in all cases accompanied with tympanitis and constipation, which in fact he says are of daily occurrence in cattle practice.—(*Il. Nuovo Ercole.*)

CASE OF DIABETES MELLITUS IN A PREGNANT BITCH [*Dr. Giuseppe Carlo Sparapani*].—A slut of seven years, pluripara, although eating plenty, has been losing flesh since four months. It is noticed almost day by day that she is getting thinner. She has great thirst, drinks in great quantity, urinates abundantly, and has progressive cataract of both crystalline lenses. She has had an attack of convulsions followed by coma, the day before the writer saw her. Her conjunctive membranes are rosy, pulse regular, respiration normal, temperature 38.8°. The border of the liver is readily felt two fingers' width below the last rib. The urine is examined; it is pale yellow, slightly cloudy, acid, with a density of 1039, evident reaction of acetone, traces of albumin, diabetic sugar 23.8 per 1000. Treatment, fleshy diet and small dose of alcoholic tincture of valerinane. Three days later she was delivered of a dead pup which had no sugar in his urine.

This case is very interesting, as similar ones are very rare, at least very few are found in veterinary records.—(*Il. Nuovo Ercolain.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D., Troy, N. Y.

REPORTS FROM PRACTITIONERS [*District Veterinarian, Dr. Ott, Untherthingan*].—Fracture of the point of the lateral distal phalanx was cured by Dr. Ott through an operation, the part being afterward well bandaged, the latter being kept constantly saturated with Liegol's solution. Complete recovery resulted in about three weeks.

As a result of a nail puncture which penetrated the bone of the foot, the cow was unable to bear weight on the affected member. As the usual methods of treatment failed to effect a cure, Dr. Ott amputated the claw. Full recovery took place in about four weeks.

After recovering from colic due to overloading of the stomach, a milch cow suddenly showed symptoms of cerebral disturbance (stupidity and sometimes an expression of anxiety), turning towards the left. The head bent over in the same direction, swaying of the hindquarters. Treatment: Ice bags, chloral hydrate, rectal injections and ruminatorid alleviated in a few hours the Coernurius invasion-like symptoms.

For local anæsthesia, Dr. Ott recommends 3 per cent. alypin. In operations he adds one drop of paranephrin to every 2 c.cm. of the alypin solution.

In otitis externa good results were obtained by using 2 per cent. solution of nitrate of silver and afterwards dusting with dymal.

Painful inflammations of the udder are readily relieved by infusions of 250 gms. of 0.5 per cent. lukewarm solution of therapogen.—(*Münchener Tierarztliche Wochenschrift*, 1910, *No.* 11.)

THE TREATMENT OF METACARPAL EXOSTOSES [*Josef Löbl*]. —The frequency of metacarpal splints occurring in the horse, their various locations—for instance, intermetacarpal, postmetacarpal, and so on—likewise their complications which frequently accompany them—pericarpitis, anchylosis, and so on—justify the efforts to cure the disease rapidly and effectively in order to render the horse serviceable in the briefest period of time. In all cases attention should first be directed to the correction of irregularities in the hoof, in order that the weight of the body may be uniformly distributed upon it.

In the case of lameness, the horse must be given rest, Prieszniz poultices must be applied, and the hydro-thermo regulator can be used with advantage. Also massage gives good results. Further, the various blistering ointments, such as Mellville's ossolin; Tempels and Bayer recommend the cantharadin ointment (1 to 4) and the ointment of the red iodide of mercury (1 to 6). Hoffman applies an ointment of iodine and mercury. Gibson, Mayall, Knauer, Plösz, removed exostoses in an operative way; the author has also been successful in removing splints through

operation. In other cases he obtained excellent results with Klein's antiperiostin. In one case in particular where the splint measured 4 cm. in length, 3 cm. in width and projecting outward 2.5 cm., the part was well rubbed with antiperiostin for ten minutes; the growth disappeared in four days; the scab loosened and fell away at the end of six weeks; the horse was laid up for four days only. In another case, where the splint on the metacarpus attained a size of 5 cm. in length, 2 cm. in width, and 2 cm. in thickness, to which the remedy antiperiostin was applied, at the end of the fifth week the splint disappeared. In this case the part was severely rubbed which resulted in a gangrene of the skin. However, the part healed over completely in about three weeks.—(*Allatovvosi Lapok*, 1911, *No.* 7.)

CONCERNING PALPATION OF THE EYEBALL WITH THE INDEX FINGER FOR THE DIAGNOSIS OF MOON BLINDNESS [*Military Veterinarians, Junot and Roger*].—The authors have found that in horses affected with moon blindness a peculiar reaction is apparent when the index finger is introduced between the orbit and the eyeball over the iris, then bending the first joint of this finger toward the next joint, slowly and gradually exerting a pressure upon the eyeball. As soon as this pressure is felt by the horse, he reacts immediately if moon blind; he moves his head suddenly and violently away from the observer to avoid the pressure, just as if the eye was being treated by faradization. The symptoms are explained thus: The pain is produced by pressure upon the inflamed choroid and iris, and this is evident in all moon-blind diseased horses even when slight pressure is brought to bear upon the eyeball. The reaction just described is not to be confounded with similar movements of the head when pressure is exerted at the same point suddenly and violently without warning to the horse. In the case of nervous and excitable animals patience and command of temper must be exercised. The authors have made investigations on 300 horses, and from these they conclude as follows: First, the horse which does not react to pressure on the eyeball over the iris is not affected with moon blindness. Second, the horse which reacts with a sudden, violent movement, as if he were struck by an electric discharge, is suspicious as suffering from moon blindness, although on examination of the eye no lesions such as keratitis, conjunctivitis, or injuries to the organ are perceptible.—(*Berliner Tierarztliche Wochenschrift, No.* 14, 1911.)

PERHYDROL OF ZINC AND ITS APPLICATION IN THE TREATMENT OF WOUNDS [*Dr. E. Hansschmidt*].—Zinc perhydrol has in combination the disinfecting power of the perhydrols with the astringent properties of the zinc oxides. The remedy is applied in the form of an ointment in the treatment of ulcus cruris with success, in scalds and burns from explosions, in infected and non-infected wounds. In slight wounds a 10 per cent. ointment is sufficient in strength; in severe wounds a 20 per cent. ointment is recommended. It is superior to all other antiseptics. Fresh applications of the ointment are necessary every third or fourth day. Apart from the disinfecting action of this agent, it has an anæsthetic and a hæmostatic effect.—(*Fortschritte der Medezin, 29 Jahrg.*, 1911, *Seite* 36.)

CONCERNING THE BEST METHODS OF RENDERING THE UDDER OF THE COW GERM-FREE AND ITS INFLUENCE UPON BACTERIA AND ON THE IMPURITIES IN THE MILK [*Karl Volmer*].—The author determined the bacterial contents and in some cases also the filth contents of milk after the udder and right flank of the cow had been treated by various methods before milking. The procedure was as follows: Dry wiping, moist wiping, moist wiping and greasing, dry bran, dry bran and greasing, washing with soap and water, washing and greasing, dry wiping and greasing, moist bran, wiping with oil, washing with a 1 per cent. soda solution, with a 2 per cent. soda solution, wiping with a 2 per cent. soda solution and then oiling. A milk scant in bacteria and almost free of filth may be obtained by wiping the udder and flank with a 2 per cent. soda solution followed with an application of oil. In order to obtain from the udder milk free from bacteria and filth, the methods just enumerated are not effective for the purpose.—(*B. T. W., No. 27*, 1911.)

Dr. R. C. Longfellow (M.D.), of the Toledo Clinical Laboratories says: "Enclosed find my subscription for 1912, and it gives me pleasure to say that the AMERICAN VETERINARY REVIEW is one of my constant helpers in my work for the veterinary profession.

I find in the REVIEW articles of interest and help in other lines which have a bearing on human matters and profitable to me in my general laboratory service to all the professions. My greetings and kindest wishes for the REVIEW for 1912, its continued benefit to 'both man and beast.'"

BIBLIOGRAPHY.

A MANUAL OF PATHOLOGY.

SECOND REVISED EDITION.

A MANUAL OF PATHOLOGY. By Guthrie McConnell, M.D., Professor of Pathology and Bacteriology, Temple University, Medical Department, Philadelphia. Second Revised Edition. 12mo of 531 pages, illustrated. Philadelphia and London, W. B. Saunders Company, 1911. Flexible leather, $2.50 net.

The author claims his work to be only a manual, not to supplant the larger and more complete text book. Careful reading of its pages indicates it to be just what the author intends the work to be: neat, small volume, flexible covers; can be placed in the pocket.

Dr. McConnell has given the student, the busy practitioner, a working and consulting manual of pathology, covering the essentials, the important matters dealt with only, in a clear, easily understood and terse language, that of the teacher.

The chapters on tumors, well described, are freely illustrated from various authentic works, which will greatly aid the student and practitioner in his microscopic diagnosis.

The chapters on immunity, blood, are short, possibly too limited in the everyday investigations, and should have mentioned Jenner's stain, as it is so universally used in all schools of medicine and clinical laboratories.

It seems to the reviewer, that in the present-day blood and serum diagnoses, complement fixation technics, that a mention of the Wassermann technic and modifications should have been given, as it leaves the reader at a loss for these now very important technics.

The chapters on bacteriology, media making, are good and up-to-date, with the exception of specific directions as to correcting reactions by more sensitive indicators, and lacking in the mention of the more modern differential medias for typhoid and colon search.

Few errors have accidentally crept in, possibly during the reading of the proofs, among which, on page 236, mention is

made: "Celloidin has the advantage of not requiring heat, and can be used for larger pieces of tissue. * * * Paraffin can be used for small pieces of tissue only." In fact the reverse is true, for in very small bits of tissue, like uterine scrapings, where an assembled number may only be size of a wheat grain, celloidin is the only method to use, as the melting out of the paraffin would loosen and render useless the fragments for staining.

One statement made on page 253, "The agar will melt at 42° C.," is a mistake, as it will remain melted at that temperature, but requires a much higher temperature to melt it from a solid state. There is, however, so much good matter in this little manual that the few shortcomings, errors, do not detract from its worth to the student or busy practitioner.

The chapters on special pathology are well written, the lesions fully described, and clear illustration of the subjects.

The clear type, excelent paper stock used, binding excellent, leaves nothing to be wished for by the reader, and the publishers are to be congratulated on their work and with the very easy, full index, makes it a very useful, as well as desirable manual, and should be in the working library of every pathological student and worker.

THE AUTO AND CARRIAGE FACTORY.—The increasing demand for buggies, carriages and all kinds of vehicles with the growth and development of the automobiles and mechanical traction has surprised everybody.

True, "the auto helps the horse," but the demand for good horses is greater than the supply and prices the highest in all the world.

After canvassing the leading manufacturers of horse-drawn vehicles, the New York Carriage Dealers' Journal ventures the prediction that sales of carriages and wagons will increase 100 per cent. in the next ten years. The great Studebaker concern alone will turn out this year about 100,000 horse-drawn vehicles, according to the present outlook, and several others are close on the heels of the famous South Bend builders. One manufacturer in New York state says he can not see that the builders of motor cars are in any real competition with him, so prosperous is his business. Another says his full force is working twelve hours a day, and another reports the best demand in years for light carriages. *Live Stock Journal.*

ARMY VETERINARY DEPARTMENT.

In the belief that they will serve as a stimulation to the many veterinary organizations—state, city or other local associations—there are published below the resolutions passed by the Illinois and Georgia Associations in December. Dr. Peter F. Bahnsen, State Veterinarian of Georgia, writes from his office in the capitol, Atlanta, that, in accordance with the resolutions passed by their State Association, a letter, enclosed in which is a copy of the resolutions, has been sent to each Senator and Representative to Congress from Georgia, calling upon them to support the passage of the bill "to consolidate the Veterinary Service, U. S. Army, and to increase its efficiency." The Illinois State Veterinary Medical Association passed favorable resolutions and instructed its secretary, Dr. Louis A. Merillat, who has a brother a retired captain of the regular army and whose son is in West Point preparing to become an officer of the army, to do much work in the propaganda for the passage of the bill. These resolutions and the action of the associations, it is hoped, will serve as an object lesson to all other veterinary organizations to do likewise. Unswerving loyalty to this great cause must take on an absolutely practical form. The Senators and Representatives to Congress must be written to and be shown the necessity for, the justice of and the demand for the passage of the bill. They will listen to and heed the dictates of those whose support they need in order to hold office. Hundreds, nay, perhaps thousands of letters of this character addressed to them by their constituents will be read and become effective. What Illinois and Georgia have done can be done by all the State associations if they profit by example. There is nothing like the contagion of enthusiasm. The representatives of the profession in the army are grateful for what Illinois and Georgia have done and are sure that all other state and local associations will make common cause in the interests of the bill.

D. A. H.

RESOLUTIONS PASSED BY THE ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION AT ITS 27TH ANNUAL MEETING IN CHICAGO, DECEMBER 7, 1911.

Resolved, That we, the members of the Illinois State Veterinary Medical Association, assembled in our Twenty-seventh Annual Convention in Chicago, this seventh day of December, 1911, do express our deep sympathy with the movement to secure commissions for veterinarians in the United States Army, and pledge ourselves, individually and collectively, to support the plan to secure such commissions for our brothers of the Veterinary Profession in the Cavalry and Artillery Corps the Subsistence and Quartermasters' Departments, United States Army, by means of a bill to be enacted by Congress in its present session.

Be it further Resolved, That the Secretary be instructed to make it his duty: (1) To present a copy of these resolutions to each veterinary journal in the United States for publication; (2) to send a copy of these resolutions to each State, city or other local veterinary association in the United States, inviting them to co-operate in the movement mentioned; (3) to send a copy of these resolutions and a letter to each Senator and Representative to Congress from the State of Illinois, inviting his support of the bill to commission veterinarians in the United States Army; (4) inasmuch as only a proportion of our total membership are present at this meeting, that the secretary be instructed to send a copy of these resolutions to each member on the roster of the Illinois State Veterinary Medical Association, together with a letter or other literature, explaining fully the necessity for commissioning veterinarians in the United States Army and the gross injustice being done to the veterinary profession therein.

RESOLUTION ADOPTED AT THE FIFTH REGULAR ANNUAL MEETING OF THE GEORGIA STATE VETERINARY ASSOCIATION ON DECEMBER THE 21ST AND 22D, 1911.

"*To the Honorable Senators and Representatives of the State of Georgia in Congress of the United States, Greeting:*

"Whereas, the veterinary profession has been officially recognized by the United States Department of Agriculture and by the various states; and,

" Whereas, The United States Department of Agriculture has stipulated certain requirements which the veterinary educational institutions must demand of matriculants in order to gain the recognition of said department; and,

" Whereas, The veterinary educational institutions have complied with said requirements; and,

" Whereas, The veterinarians now in the service of the U. S. Army are graduates of said recognized institutions, and are deserving of recognition by the War Department as professional men; and,

" Whereas, The United States is the only civilized country which does not grant such recognition to its army veterinarians; therefore,

" Be it Resolved, That the Georgia State Veterinary Association, in convention assembled, do hereby request your favorable consideration of a bill for the relief of said U. S. Army veterinarians, entitled, ' A Bill to consolidate the Veterinary Service, United States Army, and to increase its efficiency.' "

(Offered by the Committee on Resolutions.)

Unanimously adopted as read.

PETER F. BAHNSEN, *Secretary.*

ARMY NOTES.

Dr. Charles W. Johnson, veterinary inspector in charge, Subsistence Department, United States Army, died in Washington December 29, 1911, in the fifty-seventh year of his age, and was buried in Elburn, Ill., January 1, 1912. Dr. Johnson, a graduate of the Chicago Veterinary College in the early '80s, was in the institution in the days when Dr. A. D. Melvin was a student. He served the Government as a veterinary inspector for nearly twenty years, having been for nearly ten years an inspector for the Bureau of Animal Industry in Omaha and Chicago. When the army was reorganized after the Spanish-American War, as a result of the embalmed beef scandal, it was decided to employ veterinary inspectors to prevent the recurrence of such scandals, and Dr. Johnson was the first appointee. He was transferred from the Bureau of Animal Industry for the purpose and took the oath of office July 9, 1901. From that time until his death he was expert for the Subsistence Department of the Army in

Chicago. He was well known for his astuteness, his high sense of duty and the rigor with which he carried on his inspection work. He was held in highest esteem by the Commissary General and all officers of the Department who came in touch with him.

His sad end illustrates well the wisdom of the bill for the consolidation of the Veterinary Service, United States Army. Last March Dr. Johnson was ordered to the maneuver camp, San Antonio, Texas, when the army moved towards the Mexican border. In bad health when he departed, he came worse when he arrived. Soon he was placed in the maneuver camp hospital. His case was diagnosed as dementia, and he was ordered to the Army Hospital for the Insane, St. Elizabeth's, Washington. There he remained until his death. His expenses in the hospital were paid for by the Government. But as he was merely a civilian he had no protective rights, nor right of retirement for disability incident to army duty. After two months in the hospital his pay was stopped—a hardship upon his family. Seven or eight months in the hospital under such circumstances cannot be reckoned as a gain, nor contemplated except with a feeling of shame that the War Department could not assure protective rights in so serious an emergency. Dr. Johnson's case towards the close was diagnosed as tuberculosis, probably with cerebro-meningeal tuberculosis, causing insanity. Secondarily he was afflicted, according to the army medical officers, with pernicious anemia and arterio-sclerosis.

D. A. H.

The bill "to consolidate the veterinary service, U. S. Army, and to increase its efficiency," has been introduced into the House of Representatives by Mr. Difenderfer, and is known as H. 16843.

The War Department has ordered Dr. Daniel Le May, 4th Field Artillery, and Dr. Walter Fraser, 13th Cavalry, to proceed to Indianapolis, Ind., for the purpose of attending the annual meeting of the American Veterinary Medical Association, August 26 to 29, 1912.

The following veterinarians have recently been appointed to the Cavalry and Field Artillery:

Ralph H. Buffington, Cornell University, 1905, formerly State Veterinarian of Florida, to the 4th Cavalry.

George H. Koon, College of Vet. Med., George Washington University, 1911, to the 10th Cavalry.

Daniel B. Leininger, Kansas City Vet. College, 1906, from the Bureau of Animal Industry to the 12th Cavalry.

James R. Haynes, Kansas City Vet. College, 1909, to the 5th Cavalry.

Richard H. Power, reappointed, former services January 29, 1902, to August 10, 1910, to the 9th Cavalry.

These appointments fill the vacancies in the Army veterinary service. O. S.

The organization of the Canadian Army Veterinary Service was approved November, 1910, and consists of three branches: The Canadian Permanent Army Veterinary Corps, the Canadian Army Veterinary Corps and the Regimental Veterinary Service.

The Canadian Permanent Army Veterinary Corps shall consist of veterinary officers gazetted to the corps and of non-commissioned officers and privates enlisted therein. The names of the officers so gazetted shall be arranged on a regimental list of officers of the C. P. A. V. C. in order of seniority.

DETACHMENTS.—C. P. A. V. C.—Officers, N. C. O.s. and men of the C. P. A. V. C. will be detailed by the officer administering C. A. V. S. to form detachments for duty as required in commands and independent districts.

The Canadian Army Veterinary Corps shall consist of veterinary officers gazetted to the C. A. V. Corps. Their names shall be arranged on a regimental list of officers of the C. A. V. C. and they will be detailed for duty with mounted corps of the active militia as required for a period not exceeding four years. When it is considered advisable, this term may be extended.

REGIMENTAL VETERINARY SERVICE.—This branch consists of the veterinary officers at present on the regimental staff of mounted corps. No veterinary officers shall, in future, be so appointed. The number of the personnel of both the C. P. A. V. C. and of the C. A. V. C. shall be as laid down in the establishment list annually approved by the Governor-in-Council.

RANK, PAY AND PRECEDENCE.—Officers will be entitled to rank and precedence, and subject to the provisions of the pay and allowance regulations, other advantages attached to corresponding rank of combatant officers, but such rank or position will not entitle the holder of it to the presidency of courts-martial, other than regimental, nor will they exercise any military command outside the C. P. A. V. C. or C. A. V. C. except over such officers or soldiers as may be attached thereto for duty.

CORRESPONDENCE.

CHICAGO, January 11, 1912.

Editor AMERICAN VETERINARY REVIEW, NEW YORK CITY:

I have just finished reading the January number of the AMERICAN VETERINARY REVIEW, more especially that part which has to do with the new *Army Veterinary Bill.* My heart is full and my joy overflowing on account of the Titanic energy that you have thrown into this movement, which, as you say, is for the good of the *Army Veterinary Service,* but also of endless good to the *veterinary profession of the whole American continent.* Time will show that what you said in your editorial in the January REVIEW is true; that such a reform will be uplifting beyond any recognition on the part of the veterinarians living at the present, to the profession as it will be in the future. We men who are now living should be optimists and utilitarians, and should therefore have in mind the fact that conditions to-day are as nothing; that we should work for the enlargement of the veterinary horizon, for the improvement of the veterinary profession which will grow in power, in effectiveness, in influence, as time goes on; provided we who are now living and work in it can be united in such a manner as will enable us to combine our energies to bring about this better future. Hence, my good Editor, I may say, in all sincerity, that I am proud of you and still more proud, if possible, of what you have done for the Army Veterinary Service in your high-minded editorial in the January number of the AMERICAN VETERINARY REVIEW, and in the care in your arrangement that you showed in the printing of the matter in that number found under the "Army Veterinary Department."

A happy New Year to you. Wouldn't it be fine, if, before the coming of the fiftieth anniversary of the American Veterinary Medical Association, to be held in New York City in 1913, we find that we have founded in the army a veterinary corps which has within itself the means for its own development and for a lasting good to the profession? This can be done if the numerous strong-minded men in the profession, like yourself,

add might to might, double and redouble energies until this bill becomes a law.

With my best compliments, cordially yours,

D. ARTHUR HUGHES.

CLEVELAND, O., January 7, 1912.

Editors AMERICAN VETERINARY REVIEW:

The Veterinary Section, Cleveland Academy of Medicine, held its first meeting of the year on January 5 and elected the following set of officers:

Dr. Wm. Redhead, president-elect.

Dr. James Considine, secretary.

Dr. A. S. Cooley, counselor of the section to the academy.

This section has held monthly meetings during the year except summer months. Instructive papers by members have been read and cases of interest reported.

Members of this section always have the opportunity of attending lectures given by the academy in its various sections. The academy proper makes up a course and has men of note from various parts of the country deliver lectures or talks upon subjects of interest.

Our section has planned to assist the state organization in the prosecution of illegal practitioners. We hope to do some effectual work along this line. It is time that something was done. Our state has spent thousands of dollars in the equipment of a veterinary department of the university to educate and make efficient men for the profession, and yet our legislature will amend laws to let the quacks in or neglect to enact laws to keep them from practicing in competition with the young men the state educates. We secured the approval of the academy and their assistance can be asked for in this work.

As one of the state board of censors I think I can say that we are getting well organized in this state to do effectual work. One year ago, while our state meeting was in session, we suddenly learned that our law (which we thought good, and the quacks feared) was about to be amended to favor the illegal and uneducated man to get in practice. We threw our influence against the amendment with the good services of Louis P. Cook, and prevented the adoption of them; for there was one in the Senate and another in the House offered.

The association officers met with the censors and formulated plans to work on. Our first work was to organize a committee of eighty-eight, one from each county in the state, to work with us, keep us posted on anything coming up of interest to the profession. We were careful to pick good, live men, of good character and influence, to work on this committee. At the same time to give us names of places likely to be good places to locate qualified men.

Our next work now will be to start prosecution of several in different parts of the state and try out the law. This will be up to the state association. We hope to instill into the organization a life of work, hard work for the betterment of the profession, becoming an influential factor in the work in our state, co-operating with the committees of the A. V. M. A. in their work of a national character.

(Signed) A. S. COOLEY.

NASHVILLE, TENN., November 27, 1911.

C. BISCHOFF & CO., NEW YORK:*

GENTLEMEN—As per your request, I am sending you report of 2,023 dairy cows, tested with the *Intracutaneous Test*. As this is the third year our dairies have been tested, the percentage of reactions was small. There were 5,126 cows tested here this year, of which we tested 2,023 with the intracutaneous test; of these 2,023 animals tested, 28 reacted and were slaughtered, 25 showing tubercular lesions. The other veterinarians tested 3,103 and found six reactors; these 3,103 were very nearly all tested with the subcutaneous test. Every one of our 28 reactors was retested and, without a single exception, they reacted to the second test, showing enlargements just about the same size on both sides of the neck. It was very noticeable that in herds where we had never found any diseased cows in the two former tests, not a trace on a single animal was shown; but every time we injected a herd where we had found diseased animals before, from one to ten would react. The intracutaneous test showed 14 reactors per 1,000, while the subcutaneous test showed 2 reactors per 1,000.

* A copy of a letter addressed to C. Bischoff & Co., from a patron, published at the former's suggestion, that the profession in general might benefit by Dr. Bell's experience as presented to them.

If the tuberculin test is made for the purpose of ridding the herds of tuberculosis, there is no doubt that the intracutaneous test is by far the best, as it will react on many slight as well as advanced cases in which the subcutaneous test will not; besides, it is much more humane and does not inconvenience the dairyman. When a herd is tested by the subcutaneous test in spring or summer, the cows will go off a large per cent. in their milk, which is positive proof that they have undergone a hardship and one far-reaching in its effects; the cow suffers, the dairyman loses milk and subsequently money, while his customers are short of milk. The subcutaneous test was all right when we had none better, but it is a back number to-day when we have a method so far superior. Again, the subcutaneous test is unsanitary and liable to spread disease where the temperature of a large herd is taken repeatedly and the custom followed of attaching strings to the thermometers and clamping them to the tail, in which case the thermometer will easily become contaminated with contagious abortion and, hanging over the vulva, is liable to spread the disease through the herd, thus doing inestimable damage. With the intracutaneous method there are none of these objectionable qualities:

It is clean; the subcutaneous test is not.

It is safe; the subcutaneous test is not.

It is reliable under all conditions; the subcutaneous test is not.

It cannot be plugged against; the subcutaneous test can.

It shows the stage of disease; the subcutaneous test does not.

It does not set the cattle back in milk; the subcutaneous test does.

It causes no rise in temperature of reacting cows; the subcutaneous test does.

It saves people from using milk from cows that are giving a constitutional reaction at the time they are milked and before they are condemned. The milk from a tuberculous cow that has been thrown into a state of fever from a constitutional dose of tuberculin, is many times more virulent than it had ever been before; yet people use this milk, for it is milked after the tuberculin was injected and before the cow was condemned, and while the virulence was at its highest point more damage could probably be done with one spoonful of milk taken at this time than such a cow's milk could probably do in several years under her physiological and yet pathological condition. All this danger is avoided by the intracutaneous test, as it reacts only locally.

I cannot see where the old subcutaneous tuberculin test has a foot to stand on in the presence of the later developments of the intracutaneous test, which has not one objectionable feature. It has been condemned by some, but those who condemn it never used it, and will not under the hardest pressure say why they condemn it and wherein it is weak.

Yours respectfully,

(Signed) WM. M. BELL, M.D., D.V.S.

QUALIFICATIONS (*continued from page* 632).—After five years' service in that rank, *Veterinary Lieutenants* may, if recommended by the P. V. O. of the command or independent district, and after successfully passing the examinations laid down in the regulations for the Canadian Army Veterinary Services, be promoted to the rank of *Veterinary Captain,* and Veterinary Captains, after ten years' service in that rank, may be promoted to the rank of *Veterinary Major.* Veterinary Majors, after five years' service in that rank and who have served consecutively during twenty years as veterinary officers, may be given the rank of *Veterinary Lieutenant-Colonel.* Officers of the Regimental Veterinary Service will be governed by the provisions of paragraphs 17 and 18 as regards promotion. The appointment of these officers will remain as at present, *viz., Veterinary Lieutenant, Veterinary Captain* and *Veterinary Major.* The following regulations will be observed in the appointment of qualified candidates to the Canadian Permanent Army Veterinary Corps. The rates of pay and rules regarding promotion and retirement of veterinary officers are laid down in the pay and allowance regulations and in K. R. and O. for the militia. Candidates for admission to the C. P. A. V. C. must make written application to the secretary of the Militia Council. The minimum age of candidates is 21 years, and the maximum 35 years, except in very special cases when the latter limit may be exceeded. Candidates will not be accepted unless, in the opinion of the Minister in Militia Council, they are in all respects suitable to hold commissions in the Canadian Permanent Army Veterinary Corps. Every candidate must be a British subject and a graduate of a recognized veterinary college, and will be required to pass an examination before a board of veterinary officers before being granted a commission. He will be required to forward a certificate of birth or satisfactory proof of age with his application. If his application is approved, he will be required to be certified by an officer of the P. A. M. C. being physically fit.

SOCIETY MEETINGS

KANSAS VETERINARY MEDICAL ASSOCIATION.

The eighth annual meeting of the above association was held at the Veterinary Building of the Kansas State Agricultural College, Manhattan, December 27, 28, 29, 1911.

The president, Dr. W. N. Hobbs, called the meeting to order at 1.30 p. m. As the secretary, Dr. Burton Rogers, was absent, Dr. J. H. Burt was appointed by the president as secretary *pro tem.* A large number responded to the roll call. The minutes of the last meeting were read and approved.

The address of welcome was delivered by Prof. A. Dickens, of Manhattan. Dr. F. W. Caldwell responded.

Thirty-eight applicants were next received into full membership.

At this session the following papers were presented and caused some instructive discussion: "Bacterins, Their Manufacture and Uses," by Dr. L. B. Barber; "Corn Stalk Poisoning," by T. P. Haslam. The brains of some animals that had died of corn stalk poisoning were exhibited.

Adjourned at six o'clock, to meet again for the second session at 7.30.

At the evening session, Supt. J. H. Miller, of the extension department, spoke of the advancement of farming and pointed out how the veterinarians could help the farmer by advocating better stock and the right kind of stock for certain localities.

Owing to the absence of Prof. L. Bushnell, of the bacteriology department, Dr. J. G. Jackley presented a paper on "Bacteria," which was well received. Drs. Kern, Basseler and Groome reported a number of interesting cases which created quite an instructive discussion.

The meeting adjourned at 10 p. m. to meet again December 28, 8 a. m.

The third session began at 8 a. m. Thursday, December 28. Dr. F. S. Schoenleber gave a talk on tuberculosis. Hon. J. H. Mercer, Live Stock Sanitary Commissioner, spoke on the laws

regarding the testing of cattle for tuberculosis and the disposal of the reactors.

At 10 o'clock the meeting adjourned for the members to pay a visit to the anti-hog-cholera serum plant.

At the fourth session, which began at 2 p. m., the election of officers took place. Dr. W. N. Hobbs was re-elected president; Dr. Burns, first vice-president; Dr. Tice, second vice-president; Dr. J. S. Burt was elected secretary-treasurer; Dr. Guilfoil was re-elected as a member of the executive committee until 1915. A motion was carried extending a vote of thanks to the retiring secretary, Dr. Burton Rogers, for the good work he had done.

The Committee on Resolutions were, C. B. Kern, chairman; C. W. Hobbs, H. R. Groome.

The following resolution was accepted:

Whereas, We feel that the veterinarian is an important and necessary part of the army service, and

Whereas, As there is now pending before Congress a bill to better the condition of the veterinarian in the army, be it

Resolved, that the K. V. M. A., now in session, urge the member of the Kansas delegation to Congress to carefully consider this bill and the brief accompanying it, and give it their support on the floor of the House and Senate to the end that it become a law, and

Be it further Resolved, That each member of this association take it upon himself to personally urge the delegates to Congress from his own district to support this bill.

Dr. C. W. McCampbell gave a talk on the stallion registration law, showing how the horse breeder is being protected. Dr. McCampbell showed photographs of certificates of pedigrees which the registry board had found were incorrect.

Meeting adjourned at 6 p. m.

The fifth session met at 8 p. m.

Dr. O. Verschelden presented a paper, "Some Observations on Blind Staggers." This paper caused a good deal of discussion as this disease is quite prevalent in some parts of the state. Dr. E. C. Bates and others reported some interesting cases.

As Dr. Reichenecker was not present to deliver his paper on "Hog Cholera," Dr. F. S. Schoenleber spoke on this subject and urged that results, both favorable and unfavorable, following the use of the serum furnished by the college be reported to the college. The meeting adjourned at 10 p. m.

The sixth and last session met at 8 a. m., December 29. As this session was devoted entirely to clinic, the reading of a number of papers had to be postponed. Dr. W. H. Richards, of Emporia, performed oophorectomy upon some heifers. This operation was very interesting and instructive, as Dr. Richards makes an opening in the flank not larger than to admit the thumb and forefinger, both ovaries to be removed through the opening on one side. As the opening is small, and the leg extended in such a position that the opening through the skin and muscles are not in apposition when the animal is released, no stitches or after-treatment is necessary.

Dr. R. R. Dykstra performed an operation for roaring by removing the mucous membrane of the ventricle beneath the vocal cord. Dr. Dykstra also operated upon a mule and Dr. L. L. Conkey performed oophorectomy on some sows. Unfortunately, a visit to Fort Riley had to be postponed.

The meeting was the best in the history of the association, about 125 members were present.

The meeting adjourned at 12 o'clock, December 29, 1911, to meet at Topeka, January, 1913.

J. H. BURT, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular monthly meeting of this association was called to order by President-elect George H. Berns, of Brooklyn.

The minutes of the December meeting were read and approved.

Dr. Clayton, chairman of the "Smoker" Committee reported that arrangements were about complete for the annual reunion and smoker of this association and urged every member to be present and bring a friend along.

Dr. C. N. Darke, chairman of the Prosecuting Committee for 1911, who was unable to be present at the annual meeting, made his annual report which was duly approved.

Dr. Berns then announced the following appointments for 1912:

Board of Censors—Dr. R. W. Ellis, chairman; Dr. C. E. Clayton, Dr. W. W. Cochran, Dr. Chas. Jamieson, Dr. G. F. Bowers.

Judiciary Committee—Dr. W. Reid Blair, chairman; Dr. E. B. Ackerman, Dr. P. Burns.

Prosecuting Committee—Dr. W. J. McKinney, chairman; Dr. D. W. Mangan, Dr. R. H. Kingston.

Dr. Berns then thanked the association for the honor of his election as president and then gave an interesting address on the "Value of Veterinary Associations."

In this address the doctor brought out the points that veterinary associations promote good feeling and by discussion of different subjects obtain greater proficiency among the members. Also considers it the best post-graduate school for a busy practitioner. They elevate the standing of the profession and enable us to gain recognition, as well as to advance veterinary science.

Dr. Berns also mentioned the fiftieth anniversary of the A. V. M. A., which will be held in New York City in 1913, urging that this association do all in its power to promote the success of this meeting.

Dr. R. W. Ellis then gave an interesting address on "My Impressions of the Chicago Meetings."

The doctor stated that his first impression was that he was attending a second A. V. M. A. meeting in the same year, there being so many veterinarians present. Was also impressed by the diversity of opinions on different questions which arose and the earnest manner in which they were debated.

Tuberculosis in cattle was discussed at great length and the intradermal and opthalmic tests were demonstrated by Dr. Mohler of the B. A. I. on 140 head of cattle at the stock yards. Dr. Mohler demonstrated the accuracy of these tests by slaughtering the reactors and holding post-mortem examinations.

Dr. Ellis was also strongly impressed by the grand exhibit of cattle at the Fat Stock Show.

Drs. Kingston and Clayton described an interesting case of calculus in a horse's bladder, which had caused difficulty in urinating for a long time.

The doctors decided to operate and with the assistance of Dr. R. W. McCully this was done. It was found to be impossible to crush the stone so the neck of the bladder was dilated, and after a long and tedious manipulation a stone weighing over 12 ounces was removed.

This animal was operated on December 20, 1911, and at present (January 3, 1912) shows every indication of making a complete recovery.

This case report created an interesting and instructive discussion on the subject of calculi.

Dr. Greissman described an interesting case in a horse which he was called upon to attend. On arrival he found the animal down and unconscious, and owner stated he had been down for eight hours. The doctor bled the animal, removing about eight quarts, after which the animal suddenly jumped to his feet. The urine was removed and about two buckets full of fæces taken from the rectum, after which the animal again dropped down. He was placed in slings, and the only treatment given was alcohol and water. The animal remained in slings four days, was removed and made a complete recovery.

This case report brought forth several different opinions as to the cause of this condition. It was suggested that it was due to a disturbance of the central nervous system, auto-intoxication, or pressure due to the accumulation of the fæcal mass in the lower bowel.

Drs. Percival K. Nichols and Alexander Schlesinger were elected members of the association.

NEW BUSINESS—Under the head of "New Business," Dr. Robert W. Ellis called the attention of the members to the bill to consolidate the veterinary service in the United States Army and to increase its efficiency. The doctor made a strong appeal in behalf of the bill, pointing out the *general* elevating effect upon the entire American veterinary profession that would accrue from the elevation of the veterinarian in the army to the rank merited by his professional attainments, and offered the following resolution which was unanimously adopted by the association: "Be it Resolved, That this, the Veterinary Medical Association of New York City shall go on record as indorsing the work of the Committee on Army Legislation of the American Veterinary Medical Association and as pledging their support to said committee, both as an organization and individually."

Drs. Cochran and Bowers stated that they would contribute papers on some interesting subject for the next meeting.

It was regularly moved, seconded and carried that the March meeting of this association be held at the Berns Veterinary Hospital in Brooklyn.

Dr. Chase spoke of the need of inspection in the outlying districts, as meat of diseased animals is frequently offered for sale. After some discussion it was deemed best to leave this

question to the State Society or the State Department of Agriculture.

A unanimous vote of thanks was extended to the contributors to the program of the evening.

Meeting adjourned.

R. S. MacKellar, V. S., Secretary.

SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.

The semi-annual session of the S. V. V. M. A. was held at Reading, Pa., December 20, 1911, and was called to order by President W. S. Longacre, W. G. Huyett recording the minutes.

The following members were present: Drs. W. S. Longacre, E. D. Longacre, G. R. Fetherolf, G. A. Wehr, W. G. Huyett, O. G. Noack, U. S. G. Bieber and D. R. Kohler. Visitors present were: J. J. Kenney, N. Y.; Drs. J. W. Dunkelberger, Bernville; M. D. De Turck, Oley; N. L. Schaeffer, Fleetwood, and others.

The minutes of the previous sessions were read and approved. A number of new members were proposed, the applicants being Drs. J. W. Dunkelberger, M. D. De Turck, N. L. Schaeffer, and R. L. Berger, Shartlesville. The Board of Trustees acting favorably upon these candidates, a motion was made and seconded that they be duly elected as members of this association.

Among the various communications read was one relative to the soliciting towards a fund for the erection of a monument to the late Prof. S. Arloing, a distinguished veterinarian, and who had been for many years connected with the veterinary schools of France. Upon a motion that carried, the association donated five dollars toward this fund.

Delegates to the Pennsylvania, Keystone and American Veterinary Medical Associations, representing this association, reported excellent meetings with good attendance, especially the latter, which was represented by Drs. Huyett, Noack and Fetherolf, whose sessions were held at Toronto. It was brought out that this meeting far surpassed any other session both in attendance and in increasing the membership. There is no reason why every eligible practitioner should not become a member.

Under report of committees, the Committee on Meat and Milk Inspection offered a good report, the subject being quite

fresh in their memories, though in its infancy, by the recent inauguration of dairy farm inspection throughout the state, at the instance of our devoted and energetic State Veterinarian, Dr. C. J. Marshall, and under the auspices of the State Live-Stock Sanitary Board, the most competent practitioners throughout each county taking part in this work in connection with their practice.

Dr. E. D. Longacre presented a paper upon "Rhinitis." Quite a discussion arose in reference to the proper treatment, etc.

The other essayist, Dr. McCarthy, being absent, various other cases were related and considered, but the drift of the discussions were upon dairy inspection, some inspectors relating their experiences, and noting that the inspection will be a success, as many dairymen are improving conditions, and that very little objection is raised by the former against the inspector.

One member suggested that the association decide upon a uniform price in practice in making visits, performing operations, etc., but it was the consensus of opinion that such action would not prove to be a successful procedure.

The society adjourned.

W. G. HUYETT, Secretary.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION.

The above association met December 28, 1911, at the A. and M. College, this being the fifth annual meeting of this association. The meeting was called to order by the president, Dr. E. M. Ranck, at 1 p. m., the following veterinarians being present: Drs. E. M. Ranck, John Oliver, B. M. Leigh, T. Butler, B. M. Mills, H. E. Buie, O. M. Norton, J. D. Townsen, W. H. Ewing, J. T. Alson, B. C. Mitchell and Wm. P. Ferguson. After the minutes of the previous meeting were read, committees submitted their annual reports.

The proposed act for legislation and other matters were taken up and discussed; resolutions were prepared and adopted to be presented to the Governor and members of the legislature, urging that an act be passed at the next session of the legislature to create a state board of veterinary medical examiners and require practitioners of veterinary medicine to secure licenses for the practice of their profession.

The following committees were appointed: Executive Committee, Drs. Oliver, Townsen, Buie, Leigh and Davenport. Legislative Committee, Drs. Oliver, Ferguson, Davenport, Norton and Ranck. Printing Committee, Drs. Butler, Norton and Archer.

While the meeting was not largely attended, those who were present worked earnestly for the good of the association. It is expected that the next meeting will excell all others in the way of papers, clinics and memberships.

Officers were elected as follows:

Dr. E. M. Ranck, president.
Dr. O. M. Norton, vice-president.
Dr. W. P. Ferguson, secretary and treasurer.

(Signed) Wm. P. Ferguson, *Secretary.*

GEORGIA STATE VETERINARY ASSOCIATION.*

Resolution Adopted by the Georgia State Veterinary Association in Regard to the Suppression of Certain Form of Shipping Fever or Strangles in Horses and Mules.

"To the State Veterinarian, Greeting:

"Whereas, Under the present live-stock sanitary laws of the State of Georgia, certain diseases of horses, asses and mules, which have proven a menace to the live-stock interest of the various states, are not included in the classification of infectious and contagious diseases; and,

"Whereas, It is the opinion of the various members of the Georgia State Veterinary Association that certain forms of shipping fever, influenza, stable pneumonia and strangles of horses and mules should be considered as infectious and contagious diseases and the movement of such animals so affected restricted; and,

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*See resolution passed by this association in relation to Army Veterinary Bill in Army Veterinary Department, page 677.

"Whereas, The shipping of such diseased animals invariably results in undue suffering to the affected animal, not infrequently terminating in death, and in the spread of these diseases to other localities, and in financial loss to the owners; therefore,

"Be it Resolved, That this association recommend to the state veterinarians that they promulgate, under the law now in force in the states interested authorizing the control and suppression of infectious and contagious diseases of animals, such rules and regulations as may be necessary for the control and suppression of the above-mentioned diseases; and,

"Be it further Resolved, That a copy of these resolutions be spread upon the minutes of this association, and that copies be forwarded to the veterinary associations and to the live-stock sanitary officers of each state concerned, and to the Bureau of Animal Industry."

(Offered by Drs. Jolly, Burson and Cary.)

Unanimously adopted as read.

PETER F. BAHNSEN, *Secretary.*

A BAFFLING QUESTION.—Our esteemed *confrere,* Dr. William Dougherty, of Baltimore, Md., received the following question while acting in the capacity of veterinary editor to the agricultural department of the Baltimore *Weekly Sun* some years ago. The good doctor finally succeeded in so educating the *Sun* readers that such questions ceased coming in:

"Mr. Editur of the *Sun*:

"I hav a valable cow that dropd me a Calf bout 4 weaks ago, an has never stud alone sense. I saw a cow docter an told him her Simtums an he pernounced her caise holler horn an sed he wood bring his insterments over in the mornin an releave her. the nex mornin he cum with a brase an bitt to boar her horns so as to apply terpentime an pepper, but when he rived he found she was a Buffaler cow an had no horns an sed he wood have to gow home to consult his book on such a complycated caise he left an has not been to see her sense what I desire to no is how to teet a caise of holler horn when the animule has no horns to boar and by so doing you will confeer a grate favor on a constent Reader."

NEWS AND ITEMS.

OPEN LETTER TO GOVERNOR TENER, OF PENNSYLVANIA.

OCTOBER 28, 1911.

JOHN K. TENER, Governor,
Harrisburg, Pa.:

DEAR SIR—After six months of patient waiting, I have learned by the newspapers' reports that you have finally decided not to reappoint me on the State Board of Veterinary Medical Examiners, undoubtedly because I had declined to act upon the many suggestions, or to accept the advice of numerous parties who waited upon me urging that I invoke the aid of the political bosses for my retention, and who had assured me that there would be no difficulty in retaining my place on the board if I would cease to be so active in my political efforts for better government in our state and city. To all of this I turned a deaf ear, because of my pride for my profession, and the devout hope that this board would not become a political one. More than six years ago my retention on the board was threatened, and I was strongly urged to seek the endorsements of your corrupt ally, the Ryan-Donnelly organization of this city, which I emphatically refused to do, though assured that with their endorsement there would be no difficulty in my retention. The laws which I was by my official place to enforce were intended to guarantee to the people of this commonwealth properly qualified veterinarians, and to see that those who were qualified were protected from quacks, charlatans, impostors and open law breakers.

During my sixteen years' service on this board I plead guilty to many times offending the machine of our state and city, and many of the abject followers of these organizations. In the performance of these duties, it is true I offended the political bosses of Cambria County, who in their daring disregard of law united the Senator, the Representatives for that district and the County Prosecuting Attorney, and through this combination the Grand Jury of that county denied us the right or even an opportunity of prosecuting an open and defiant law breaker, and by placing

the expense on the board, robbed the board of more than one hundred dollars—a tenth of its annual income.

It is equally true that our experience in Allegheny County, where members of the bar, who train with the machine, openly counsel with and aid law breakers and offenders against these laws, and through close relationship with the district attorneys, and the fact that some of these members of the bar never hesitate to fix juries when requisite, made our task practically impossible in ridding Allegheny County of many such offenders.

In prohibition Greene County of this state, an open breaker of these laws twice brought before the court was allowed to go free with a nominal punishment, because of the influence of a conspicuous druggist of that county, through whose store many prescriptions for whiskey were given by this breaker of the laws of veterinary medicine and surgery, which druggist it required more than six years of prosecution to convict for the many offenses he had committed in selling liquor without a license, but who was strong in the counsels of the machine of that county.

I again offended the state machine when I moved to arrest the Republican County Chairman of Monroe County, and whom, you will recall, is your present appointee as Sheriff to fill the unexpired term of a deceased Democratic incumbent, and when I reported the performance of this duty to the president of our board, and of a council of leading representatives of that district with State Chairman Walton to restrain prosecution of this law breaker. Later this letter became a matter of further consideration by the Republican bosses of Bucks County, through our president inadvertently exhibiting this written protest of such condign influences intended to defy the purposes of these laws. Subsequently a council was called in the Betz Building, at which there were several of Philadelphia's bosses, one or two Senators, following which there leaked out threats of my removal, and which later culminated in the Ripper Bill to destroy the value of these laws to the people of this commonwealth, rushed through the House in the late hours of the evening's sessions, and placed in the Senate in the custody of equally corrupt Democrats, who for more than five years, with the aid of the Republican County Chairman, a holder of office under your administration and previous ones, the judge and the district attorneys of Adams County have openly protected this notorious breaker of these laws. A man driven from Maryland as a law breaker, and under bond not to return, and guilty of breaking almost every law for public

peace and good order, thus defeating the purposes of these restraining laws. This, too, in the face of the appeals and protests of many of the good citizens of that county.

I plead guilty of offending the Republican machine of this city and its Democratic ally, in fighting for six years under every obstacle machine government can afford, the Johnson case of this city, another open law breaker, and who continued in the face of his arrest to break the law under the advice of counsel, who felt confident that this board would be compelled to give him a license. Said Johnson was furnished, as a threat, the aid of the organization's attorneys for his defense, and twice received the aid of Judge Martin's court in order to defeat the purposes of these laws. It is true that Judge Staake reversed the decision of Judge Martin: and it is equally true that the Superior Court of our state sustained the points contended for by this board in its interpretation of these laws, as well as the opinion rendered by Judge Staake.

I also arrested twice one of Senator Vare's followers, and through whom he was afforded bail, and who as a law breaker was employed by the Vare Brothers, and the work that he did denied to legitimate and licensed veterinarians in the southern portion of the city.

And once in fair Chester County, the northern terminus of the underground railway of abolition days—now the shame and disgrace of the country for burning a negro at the stake, the outcome of continued failure to punish law breakers protected by the machine and whose prosecuting officials, in the face of the most absolute evidence of guilt, freed through the grand jury a self-confessed law breaker because his conviction on the eve of an election might have injured the machine's hope of victory.

I denied to the present City Veterinarian of Philadelphia, an ex-Democrat, the right to send out a student to practice veterinary medicine contrary to law, to help carry on his practice while he was engaged in rendering city services under salary, and who willingly courted the assistance of the bosses and the "Sunday Morning Leeds Club Conference" to restrain my activity in enforcing these laws without fear or favor.

I dared to arrest Paddy Clark, a McNichol Democrat, a lodging-house keeper in the Tenth Ward, for brutally cutting the foot of a horse, and demanding and exacting $12 for the same before he attempted this brutal act, that necessitated the killing of the animal to save it from its suffering and its future useless-

ness. That another one of the same ilk, who had urged the negro to pay this money, became the bondsman of this law breaker, and so much political pressure was brought upon the magistrate that he would not allow a charge of "cruelty to animals" to lie against this law breaker; but held him for court as a violator of the veterinary practice laws; where I have no doubt the same obstacles will confront the board in securing his trial and conviction, which have been put forward in every case where we have attempted to enforce these laws, where the offender was a willing adherent of the machine.

I have also offended a number of the abject followers of the machine, members of my profession who have repeatedly refused to comply with the requirements of these laws, some of whom were compelled to comply with the same when prosecutions for so offending were about to be instituted. It is true that you have denied the request and appeal of 98 per cent. of the profession of this state who desired my retention, solely because of my earnest efforts to enforce these laws. I know you are in possession of private communications from abject followers of the machine who charge me with being a Bryan Democrat, to which I plead guilty, and therefore, should hold no office that the machine could control. These same men have plead with Senator Penrose for my removal, and demanded that I be denied any public state work which I was selected to do by the lamented State Veterinarian Pearson, whose sad death was largely contributed to by the demands of the state machine to put into place unfit men; to keep in place salary grabbers, who render no service, and who was forced to keep in position men guilty of gross insubordination and neglect of duty—salary and expense grabbers; and whose successor, the present State Veterinarian, has equally been forced to keep in place, against his will and judgment, one of this number at your personal request or command.

I do not deny that many letters from men high in political place and power throughout the state have only received the same consideration that similar letters from humble citizens, and which were given equal consideration in determining the action of this board, and which gave offense to many clothed with political power when the board could not see its way to grant the favors asked without violating their oath of office.

It is equally true that I have not contributed to the state and city machine the voluntary contributions requested of all who hold places under the st: .e and city administrations, and to you

I especially plead guilty of being one of the Blankenburg Committee for the defeat of John K. Tener for Governor, when I learned of the perfidy that led to the nomination of Senator Grim on the Democratic ticket and of the alliance with the liquor leagues which defeated my colleague, Dr. J. C. McNeil (whom you have also declined to reappoint), for a senatorial nomination in Allegheny County because his platform was an anti-Penrose one; and because he is a supporter of Mayor Magee, whose power and influence you have become a willing tool in destroying. Of course, I recognize I could not expect any better fate at the hands of a man whose public record had to be apologized for during an entire campaign, and who was willing to loan all his influence to smite the downtown leader through whose efforts you know you were elected Governor; because he desired to release himself from the yoke and collar you have shown your willingness to accept and wear as soon as you occupied the chief place in our commonwealth which you hold.

Of course, it is of no concern to those who have no regard for law that you have in one instance appointed one member who is not a licensed practitioner of the state and another who has on several occasions so disregarded these laws that he has for months at a time been an illegal practitioner. These members must now recognize that the machine in its throes of despair wants pliable men, for it is only those they seek to place in public positions.

I might go on and record many other like instances, but it is not necessary.

With no personal feeling or regret, conscious of a faithful performance of my public duty, and loyalty to my true professional colleagues, I sincerely deplore the placing of this board under partisan political control.

Yours in deep humiliation,

W. HORACE HOSKINS.

Through an oversight we neglected to credit Dr. Reynolds' article on Hog Cholera in our January number to the U. S. Live Stock Sanitary Association meeting, where it was presented December 6, last.

A LESSON ON CLEAN MILK.

John Mahoney was the father
Of the dearest baby girl,
And he wept to see it feeble,
Worried o'er the household pearl.

John was sad and pondered often,
Asked his wife: "Why is this true?
"Why should Nellie be so wraithlike
"When she should be strong, like you?"

Wife replied: "John, I'm heartbroken;
"While I feel entirely sure
"Dairy Bill is strictly honest,
"Can he sell milk that's not pure?

"There are times when Nellie sickens,
"Can't retain the milk at all,
"If she doesn't quickly rally
"I must Doctor Curem call.

"Dairy Bill, however honest,
"Cannot keep his dairy clean,
"For when I've examined bottles
"Signs of refuse I have seen.

"Let us try another dairy,
"We might gladly be surprised;
"Have you heard of Tuttle's dairy
"With the bottles sterilized?"

John had read of Tuttle's dairy,
Thought him cranky 'bout the thing,
But consented that they'd try him
Just to see what change would bring.

Lo! wee Nellie smiled serenely,
Took her milk and sank to sleep;
Roses made her cheeks bloom sweetly,
Breathing soft and slow and deep.

Nellie fattened, growing daily;
On John's face there grew a smile;
Wife performed her duties laughing,
There was gladness all the while.

Then said John: "There must be something
"In the way the cow is kept;
"Even though the cost were greater
"I should buy from an adept."

Quoth he: "Yes, results are worth it,
"For I've seen my baby grow
"From a wailing wee dyspeptic
"Into childhood's ruddy glow."

Thus his wife: "Ah, John, my dearie,
"We've a lesson learned, I ween;
"We shall patronize the dairy
"That is absolutely clean."

(M. E. Knowles, at the U. S. Live Stock Sanitary Ass'n., Chicago.)

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alumni Ass'n, N. Y.-A. V. C.....	.....	141 W. 54th St.	J. F. Carey, East Orange, N. J
American V. M. Ass'n.....	Week Aug. 26,'12	Indianapolis..	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n.....	.....	.....	J. B. Arthur, Russellville.
Ass'n Médécale Veterinare Française "Laval".....	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. ea. mo...	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha ..	3d Mon. ea. mo.	S. Omaha, Neb	E. J. Jackson, So. Omaha.
California State V. M. Ass'n.....	.....	San Francisco.	J. J. Hogarty, Oakland.
Central Canada V. Ass'n.....	.....	Ottawa	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n....	June and Nov..	Syracuse	W. B. Switzer, Oswego.
Chicago Veterinary Society.....	2d Tues. ea. mo	Chicago	D. M. Campbell Chicago.
Colorado State V. M. Ass'n.....	Jan. 18-19, 1912 .	Denver	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n.....	Feb. 6, 1912.....	Hartford	B. K. Dow, Willimantic.
Essex Co. (N. J.) V. M. A.....	3d Mon. ea. mo.	Newark, N. J.	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n.....	.....	.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	Dec. 21-22, 1911.	Atlanta.....	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.....	.....	.....	Louis P. Cook, Cincinnati.
Idaho Ass'n of Vet. Graduates....	Oct. 10-12, 1911..	Boise.....	G. E. Noble, Boise.
Illinois State V. M. Ass'n.....	July, 1912... ...	Springfield ...	L. A. Merillat, Chicago.
Indiana Veterinary Association...	Jan. 10-11, 1912..	Indianapolis ..	E. M. Bronson, Hartford City.
Iowa Veterinary Ass'n.....	.....	.....	C. H. Stange, Ames.
Kansas State V. M. Ass'n...	January, 1913...	Topeka.	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.....	Oct. & Feb. ea. yr.	Lexington	Robert Graham, Lexington.
Keystone V. M. Ass'n.....	.....	.....	E. H. Yunker, Phila.
Louisiana State V. M. Ass'n.....	.....	.....	E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n	January, 1912...	Portland.....	C. W. Watson, Brunswick.
Maryland State Vet. Society.....	.....	Baltimore.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	Monthly.....	Boston.....	J. H. Seale, Salem.
Michigan State V. M. Ass'n.....	Feb. 6-8, 1912...	Mich. Agr. Col.	Judson Black, Richmond.
Minnesota State V. M. Ass'n.....	Jan. 10-12, 1912..	St. Paul.....	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n....	.....	.....	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.....	Jan 30-31, Feb. 1, 1912.....	Kansas City..	Hal. C. Simpson, Denison, Ia
Missouri Vet. Med. Ass'n	.....	.....	D. L. Luckey,
Montana State V. M. A.....	Jan. 29-30, 1912.	Bozeman	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.....	January, 1912....	Lincoln.....	W. H. Tuck, Weeping Water.
New York S. V. M. Soc'y.....	September, 1912.	Utica.....	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.....	June 1912	Raleigh.....	M. J. Ragland, Salisbury.
North Dakota V. M. Ass'n.....	Jan. 1912.	Agricul. Col..	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.....	Feb. and Nov...	Lima.	A. J. Kline, Wauseon.
Ohio State V. M. Ass'n.....	Jan. 16-17, 1912..	Columbus.....	O. V. Brumley, Columbus.
Ohio Soc. of Comparative Med..	Annually	Up'r Sandusky	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.....	.....	.....	J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.....	Dec. 14-15, 1911.	Okla. City....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.....	April, 1912.....	Toronto	C. H. Sweetapple, Toronto.
Pennsylvania State V. M. A.....	March, 1912.....	Philadelphia ..	John Reichel, Glenolden.
Philippine V. M. A.....	Call of President	Manila.....	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.....	4th Tues. ea. mo.	Portland, Ore.	Sam. B. Foster, Portland, Ore
Province of Quebec V. M. A.....	.....	Mon. and Que.	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Jan. and June..	Providence ...	J. S. Pollard, Providence
South Carolina Ass'n of Veter'ns	.....	.....	Clarence E. Smith, Greenville
So. Illinois V. M. and Surg. A....	Jan. 2-3, 1912...	Centralia	F. Hockman, Louisville.
St. Louis Soc. of Vet. Inspectors.	1st Wed. fol. the 2d Sun. ea. mo.	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.....	Dec. 20, 1911....	Reading	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.....	.....	Philadelphia..	B. T. Woodward, Wash'n, D.C
South Dakota V. M. A.....	2d Tues. July '12	Aberdeen.	S. W. Allen, Watertown.
Southern Auxiliary of California State V. M. Ass'n.....	Jan. Apl. Jy. Oct.	Los Angeles..	J. A. Dell, Los Angeles.
So. St. Joseph Ass'n of Vet. Insp..	4th Tues. ea. mo.	407 Ill. Ave....	H. R. Collins, So. St. Joseph.
Tennessee Vet. Med. Ass'n.....	.....	....	A. C. Topmiller, Murfreesboro
Texas V. M. Ass'n.....	Call Exec. Com.	.....	R. P. Marsteller, College Sta
Twin City V. M. Ass'n.....	2d Thu. ea. mo .	St. P.-Minneap	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.....	Mar., 1912	Logan	A. J. Webb, Layton.
Vermont Vet. Med. Ass'n	.....	....	G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.....	.....	.....	C. H. H. Sweetapple, For. Saskatchewan, Alta., Can.
Vet. Ass'n Dist. of Columbia.....	3d Wed. ea. mo..	514—9th St., N. W.....	M. Page Smith, Wash., D.C
Vet. Ass'n of Manitoba.....	Not stated.....	Winnipeg.....	F. Torrance, Winnipeg.
Vet. Med. Ass'n of N. J.....	.....	.....	W. Herbert Lowe, Paterson.
V. M. Ass'n, New York City.....	1st Wed. ea. mo.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club....	Monthly.....	Jersey City ...	A. F. Mount, Jersey City.
Virginia State V. M. Ass'n	.....	.....	W. G. Chrisman, Raleigh.
Washington State Col. V. M. A ..	1st & 3d Fri. Eve.	Pullman.....	R. J. Donohue, Pullman.
Washington State V. M. A.....	.....	Seattle.....	J. T. Seely, Seattle.
Western Penn. V. M. Ass'n.....	3d Thurs. ea. mo.	Pittsburgh....	Benjamin Gunner, Sewickley
Wisconsin Soc. Vet. Grad	.....	.....	J. P. West, Madison.
York Co. (Pa.) V. M. A.....	1st Tue. Mar. '12	York.....	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

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Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. **Make all checks or P. O. orders payable to American Veterinary Review.**

WALTER F. SYKES & Co. have some useful information for the veterinary profession, published on page 21 (adv. dept.) of this issue.

A NOTICE at the foot of this page in the January number directed attention to page 12 (adv. dept.), for those who desired to "save themselves physical exertion," and intended thereby to call their attention to Dr. F. L. Botkin's Dental Machine, on page 11, but made a mistake in the page, which must have caused some amusement and, we trust, no annoyance. The advertisement referred to will be found this month on page 13 (adv. dept.).

VETERINARY MEDICINE is advancing so rapidly that new literature is constantly being made as new avenues of knowledge open on the many sides of that branch of medicine, and new text books are being written which, to be up-to-date, veterinarians must possess. The Chicago Medical Book Company have just issued their new 1912 Catalogue, which is full of interest and instructiveness, which they will mail free on application. You will find their address on page 12 (adv. dept.) of this issue. Mention the REVIEW when you write.

Two essentials to veterinary practice will be found illustrated on the upper half of page 28 (adv. dept.) of this issue. If you have any trouble with either of these articles they are worthless. Both must work accurately. Those referred to do work acurately, as they are made accurately. Write for their catalogue and ask about them. Mention the REVIEW when you write.